This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

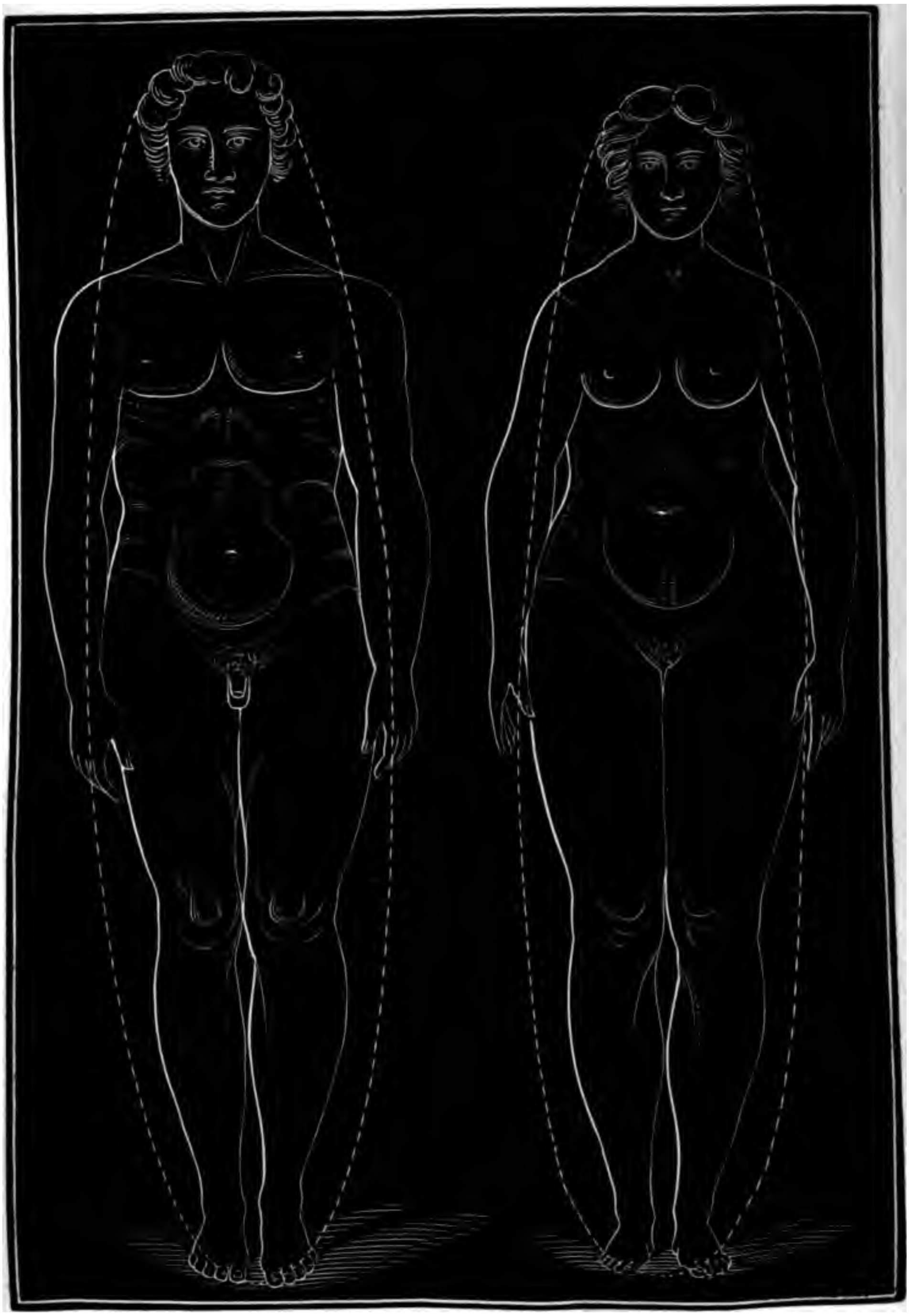
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

LANE MEDICAL LIBRARY STANFORD
X365 .K53 1855 STOR
American eclectic obstetrics / by John K
24503371112

LANE
MEDICAL LIBRARY
SEAL OF THE LELAND STANFORD JUNIOR UNIVERSITY
1885
LEVI COOPER LANE FUND



Comparison of the Male and Female.

AMERICAN

ECLECTIC OBSTETRICS.

BY

JOHN KING, M. D.

PROFESSOR OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN IN THE ECLECTIC MEDICAL
INSTITUTE OF CINCINNATI, OHIO; FORMERLY PROFESSOR OF MATERIA MEDICA
AND THERAPEUTICS IN THE MEMPHIS INSTITUTE; AUTHOR OF THE
"AMERICAN ECLECTIC DISPENSATORY," ETC., ETC.,

LANE MEDICAL LIBRARY
7815
SAN FRANCISCO

CINCINNATI:
MOORE, WILSTACH, KEYS & CO.,
NO. 25 WEST FOURTH STREET.
1855.

Entered according to Act of Congress, in the year 1855, by
MOORE, WILSTACH, KEYS & CO.,
in the Clerk's office of the District Court for the Southern District of Ohio.

CINCINNATI:
WM. OVEREND & CO.,
PRINTERS.

153
355

TO

ICHABOD GIBSON JONES, M. D.,
AUTHOR OF "THE AMERICAN ECLECTIC PRACTICE OF MEDICINE,"

AND

JOSEPH RODES BUCHANAN, M. D.,
AUTHOR OF "BUCHANAN'S ANTHROPOLOGY,"

IN VIEW OF THE GREAT BENEFIT THEY HAVE CONFERRED ON THE

MEDICAL PROFESSION,

AND ON MANKIND AT LARGE BY THEIR DISCOVERIES, LABORS AND PUBLICATIONS IN
MEDICAL, PHYSICAL AND MORAL SCIENCE;

AND

AS SOME ACKNOWLEDGMENT OF THE HONOR AND ADVANTAGE HE HAS DERIVED FROM HIS
INTIMATE ASSOCIATION WITH THEM AS FRIENDS AND COLLEAGUES,

This Volume

IS MOST RESPECTFULLY INSCRIBED BY THE

AUTHOR.

PREFACE.

DURING the lectures of the Author in the various Sessions of the Eclectic Medical Institute of Cincinnati, for several years past, in the department of Obstetrics, a great amount of inconvenience has been experienced by the classes, as well as by himself, from the want of a Text-Book, especially adapted to the teachings of that school of medicine, known as the American Eclectic; and, to obviate this embarrassment in future, as well as to aid in removing any incorrect views of the tenets of this school, which may have been based upon improper representations, has been the principal design of the Author in the publication of the present work. And, although more especially intended for the benefit of the student, imparting to him practical information not to be found elsewhere, divested of speculative theory, and presented in as plain and concise a style as the nature of the subject will admit, yet it would be highly gratifying to the Author, should its pages be found of benefit to others, particularly those engaged in practice. The sole aim he has in view is to be useful, and advance as far as lies in his power the best interests of suffering and afflicted humanity.

In American Eclectic Practice, the mechanical management of obstetrical cases varies but little, if any, from that advocated and pursued by the profession generally; but a very marked distinction will be observed in the collateral treatment, which is now for the first time presented in a published form, and in which several new agents have been introduced, not heretofore recognized in obstetrical practice. For the last twenty-two years the writer has been more or less actively engaged in the practice of his profession, and has made extensive and successful employment of the several measures made known in the present volume; and from the results of careful experience and close observation, he feels fully justified in recommending these measures as safe, succsuperior to any other means yet offered to the medical world — and which have received the commendation of every practitioner who has given them a fair and unprejudiced trial.

The introduction of Lobelia, Gelseminum, Cimicifuga, Caulophyllum. Aletris, Helonias. Asclepias, and various other agents, together with their compounds and concentrated preparations, into the Practice of Midwifery and Diseases of Females, by American Eclecticism, has proved to be an important addition to the remedies previously known and recognized by the Profession, as, through their means, the sufferings of the sex are prevented to a greater degree than has ever been accomplished heretofore by any class of practitioners, and the various ailments peculiar to them are more readily and permanently removed. The several medicines and compound preparations herein referred to, and particularly those which are not commonly met with in the medical works of the day, belong to the Materia Medica of American Eclectics, a description of which, together with their virtues and modes of preparation, may be found in the American Eclectic Dispensatory, recently published by the Author.

Yet it is not in accordance with Eclectic precepts and teachings to assume an arbitrary authority in any matters connected with the science of medicine; it is the right — it is the imperative duty of every physician to thoroughly and impartially investigate every subject connected with his profession, no matter by whom presented; he can not, with any degree of justification, attach his medical faith to the sleeves of any man — he alone is responsible for the health and lives of his patients — and, after a fair examination of medical matters, it is equally his right and duty to pursue those views and measures which he has decided to be correct, carefully avoiding, however, every means which past experience has demonstrated to be injurious and deleterious to the human system. This is American Eclecticism, and that physician only, who rigidly and honorably follows this plan, no matter in what school he may have graduated, is the true American Eclectic. Therefore, while not desiring to authoritatively force any partial or sectarian views and treatment of Midwifery upon the Profession, the Author sincerely hopes that sufficient credence will be accorded to the statements herein given, as to induce others to test and avail themselves of the remedies and treatment which, in his estimation, are unequaled by any others known.

In presenting this work as an illustration of the American Eclectic System of Practice, and in the references to the difference between the Eclectic and

Old School treatment, the Author hopes that he will not be misunderstood by the intelligent reader. The use of these distinctive terms has been rendered necessary by the existing differences in the courses of practice taught in different schools; but, it has not been his intention to refer to these different modes of practice as belonging to radically distinct and independent systems of medical science. If the progressive spirit of American physicians has led them to the discovery and adoption of many new and important improvements, they have not become so infatuated with the value and superiority of their new contributions as to have neglected the careful preservation of the great mass of well established medical science, accumulated by the labors of European physicians. Like all enlightened and liberal physicians, they aim simply to improve their knowledge and advance the Profession in those directions in which progress is most evidently necessary, without losing their sympathy and communication with all true cultivators of the science, and without desiring to be distinguished from the mass of the Profession, except by greater diligence or success in following the instructions of Clinical experience, and acquiring a more enlarged and accurate knowledge of the therapeutic powers and pharmaceutic preparations of an extensive Materia Medica. For our success in the introduction of clinic and therapeutic improvements, we are mainly indebted to an Eclectic spirit of liberality, which has discarded the formal routine of authority, for a free investigation of nature and adherence to the results of the most recent clinical experience. The universal satisfaction with which these improvements have been received, *satisfies* us, that ere long they will have the unanimous sanction of the entire Medical Profession, since they are already, so far as known and tested, cordially approved of by enlightened physicians, whatever may have been their previous doctrines or impressions.

The arrangement of the work is somewhat in accordance with the course pursued by the writer in his lectures, and is considered by him as being more specially adapted to the correct advancement of the student in this department of Medical Science. It is not supposed that the work is free from imperfections, indeed, when it is considered that it was prepared while the Author was engaged in his duties as a practicing physician, and as a medical teacher, together with other matters to distract his attention, it would be strange to find it entirely free from any demerits; it is hoped, however, that these will prove of minor importance, and will be indulgently treated by every liberal mind.

No pains have been spared to obtain and present every new and useful fact in Obstetrical Practice, and the Author has availed himself of the writings and observations of others, as far as in his power, quoting from them whenever the ideas advanced corresponded with his own, and to which he takes this opportunity of acknowledging his great indebtedness. Nor can he allow this occasion to pass without tendering his thanks to Mr. GEO. K. STILLMAN, of this city, wood engraver, for the able manner in which he has executed his part of the work.

J. K.

AMERICAN

ECLECTIC OBSTETRICS.

PART I.

ANATOMY OF THE PARTS CONCERNED IN THE FUNCTION OF GENERATION.

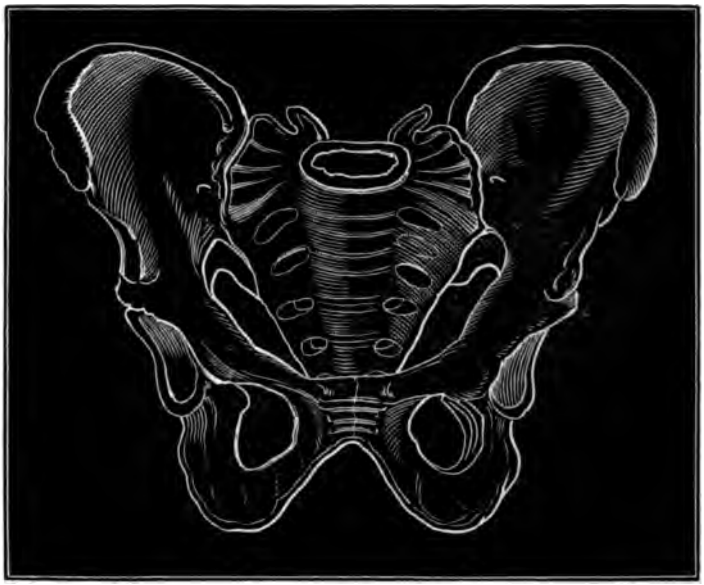
CHAPTER I.

BONES OF THE PELVIS.

By Midwifery or Obstetrics, we understand that department of Medicine which has especial reference to the Treatment and Management of Females, from the moment of conception, to the period of weaning the infant, and which comprises three distinct conditions, viz: Utero-gestation, Parturition, and the subsequent suckling of the Offspring. But previous to these conditions, during their presence, and subsequently, the Female is subject to a number of abnormal changes, peculiar to the sex, several of which are attended with much risk, destroying health, and even endangering life, and all of which, together with their appropriate treatment, should be well understood by every Obstetrician; yet, as these latter do not come directly under the head of Midwifery proper, but rather under a separate department, "The Diseases of Females," we shall not treat upon them in this work.

Without a correct knowledge of the anatomy of the Female Pelvis, and the organs proper to it, it will be impossible to comprehend the normal or abnormal changes which may take place during pregnancy, and the process of delivery, as well as their correct treatment; neither will we be able to discriminate and treat the diseases peculiar to the sex, with any degree of certainty. A reference, therefore, to the anatomy of the bones and soft part of the Pelvis, is very important in a treatise on Obstetrics.

FIG. 2.

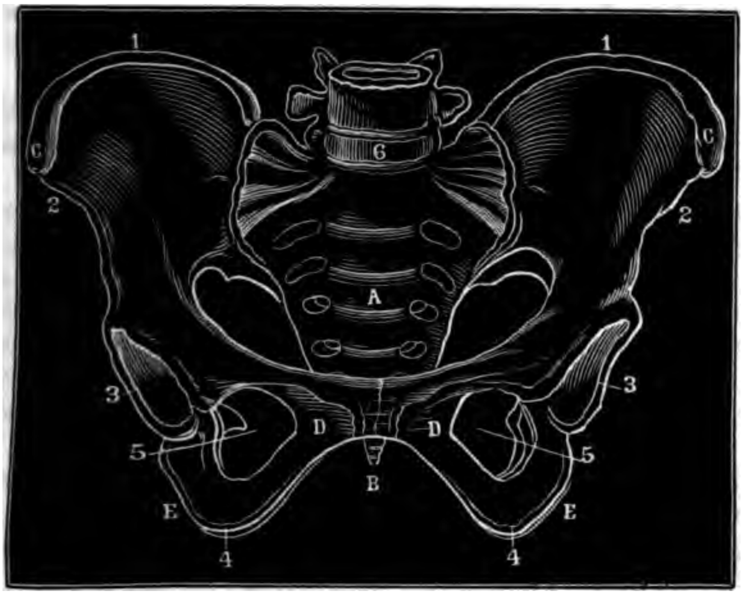


ADULT MALE PELVIS.

The PELVIS is a bony structure, of conoidal shape, with the base upward, situated at the lower part of the body, between the last lumbar vertebra, and the upper portion of the ossa femora, and which consists, in the adult, of four bones, viz: the sacrum, the coccyx, and the two ossa innominata—the peculiar form and connection of which give rise to three cavities or canals, termed the Pelvic Cavity, the Superior strait, and the Inferior strait.

The SACRUM, or *os basilare*, is situated on the superior-posterior part of the pelvis, immediately below the last lumbar vertebra, with which its superior surface articulates, above the os coccyx, and between the two ossa innominata, to each of which it is united by means of ligaments. It is pyramidal or triangular in shape, its anterior face being smooth and concave, and its posterior, irregular and convex. The concavity of its anterior face is from above downward, and its depth, in a well formed pelvis, is such, that a perpendicular let fall from a line, drawn from the apex to the base of the bone, upon the deepest point of the concavity, will measure from nine to twelve lines, or from three-quarters of an inch to an inch; this concavity is termed the *hollow of the sacrum;* it may, however, vary very much, and when too strait, or too much curved, it presents an obstacle to the easy passage of the child's head through the excavation.

FIG. 3.



ADULT FEMALE PELVIS.

A. The Sacrum.
B. The Os Coccyx.
C. C. The Two Iliac Bones.
D. D. The Two Pubic Bones.
E. E. The Two Ischiatic Bones.
1. 1. The Crest of the Ilium.
2. 2. The Anterior-superior Spinous processes of the Ilia.
3. 3. The Acetabula or Cotyloid Cavities.
4. 4. The Tuberosities of the Ischia.
5. 5. The Obturator Foramina.
6. The Promontory of the Sacrum.

During childhood, the os sacrum is composed of five distinct pieces, termed *false vertebræ*, which become firmly consolidated at adult age, and leave five surfaces nearly quadrilateral, and which are separated from each other by four projecting transverse seams or ridges, at the original points of separation. At the sides or lateral portions of these seams, are a series of openings, termed *foramina*, usually four on each side, which terminate outwardly in large grooves converging to each other, and which are named the *anterior sacral foramina and grooves*, and which serve to lodge and transmit the sacral nerves coming from the spinal canal. The nervous cords lying in these shallow grooves, are comparatively secure from injurious pressure during labor, yet it is sometimes the case, that during the passage of the child's head, these sacral nerves are exposed to much pressure, which, as in other instances of compression upon a nerve, occasions a numbness, pain or severe cramps in the parts to which they are distributed, as in the thigh, leg, or foot. This usually ceases, as soon as the pressure is relieved by the expulsive progress of the head, but when the nerves have been severely bruised or compressed, the unpleasant effects may remain for some time after delivery. In some cases, where there are agonizing pains, with symptoms of exhaustion, it may become necessary to deliver with the forceps.

External to these sacral foramina, and on the projecting cristæ which separate the grooves, arise the asperities, which serve as points of attachment to the fibers of the pyriform muscles.

The posterior surface of the sacrum is convex from above downward, rough and unequal, presenting on the median line, four eminences or spinous processes, which decrease in size as they descend; on either side of these eminences, there are four openings or foramina, smaller than those on the anterior surface, which are named the *posterior sacral foramina*, and which transmit the posterior branches of the sacral nerves. External to these foramina are a number of processes, which serve as points of attachment to several muscles and ligaments.

The lateral surfaces of the sacrum are rough, thick above, but diminishing as they descend, and in the recent subject, are covered with cartilage, which unites them to the iliac bones. The superior portion ot the lateral surfaces, which articulate with the ilium, are broad and irregular; and the inferior edges are thin and nearly sharp, and give attachments to the greater and lesser sacro-sciatic ligaments.

The base of the sacrum is about two and a half inches thick, and about four inches in breadth, and articulates with the last lumbar vertebra in such a manner, as to form a projection at the superior strait, called the *promontory of the sacrum* or the *sacro-vertebral angle*. At the posterior surface of the base, is a triangular aperture, which is the commencement of a canal, traversing the whole extent of the sacrum, which gradually diminishes in size as it descends, and in which the spinal marrow is continued. The apex of the sacrum is small, having an oval surface which articulates with the base of the coccyx.

The texture of the sacrum is spongy and cellular, and covered externally by a thin lamina of compact tissue; its length is about four and a half inches. The union of the sacrum with the ilia is so arranged, as to give great firmness and security to its position, so that it may sustain without injury, any weight from within outward, and from above downward; the sacrum entering the ilia like a wedge, having its superior portion broader than its inferior, and its anterior point of union broader than its posterior.

The OS COCCYX or cuckoo bone, so named from its resemblance to the beak of the cuckoo, is the caudal extremity of the spinal column. It is a small, single, triangular bone, the base of which points upward, and unites with the apex of the sacrum by means of an oval articular surface, which, it is said, admits of a backward motion of the coccyx, when pressed by the fetal head, to the extent of half an inch. Yet the firmness by which the coccyx is fastened to the ischia, through means of the sacro-sciatic ligaments, is unfavorable to any such mobility, except by severe and continued pressure. The coccyx is flattened, curved from behind forward, and bears some resemblance to the sacrum, though it differs from it in being much smaller, about one and a half inches in length, and in having no spinal canal. Its anterior surface is slightly concave and rough, and supports the lower extremity of the rectum; its posterior surface is convex and unequal, is separated from the skin only by the posterior sacro-coccygeal ligament, and has inserted into it some of the fibers of the glutæus magnus muscle. Its lateral edges are rough, giving attachment to the small sciatic ligaments, and the ischio-coccygeus muscle. Its apex, generally projecting in front, gives attachment to the fibers of the external sphincter ani muscle. In childhood the coccyx is formed of three or more bony pieces, but which become consolidated in adult age. The internal structure of this bone is cellular, and covered externally by a very delicate lamina of compact texture. It is called by the various names of huckle, knuckle, or whistle bone, crupper bone, etc.

The OSSA INNOMINATA, or nameless bones, and sometimes termed the haunch bones, are two in number; they are the largest and most irregular of the pelvic bones, are of a quadrilateral form, contracted in their central portions, and form the lateral, anterior and inferior portions of the pelvis. Each one of these bones consists, in early childhood, of three distinct pieces, but which become firmly consolidated in the adult. These are called the *os ilium*, the *os ischium*, and the *os pubis*, whose union takes place in the acetabulum or cotyloid cavity; the dividing lines of these three bones meet nearly in the center of the acetabulum, giving the upper and outer two-fifths to the ilium, anteriorly one-fifth to the pubis, and the remaining two-fifths to the ischium. For purposes of description, and as a matter of more easy reference, the above division is preserved by anatomists.

The OS ILIUM, hip or coxal bone, forms the upper and lateral portions of the pelvis; it is the largest of the bones of the ossa innominata, is flat, broad, and nearly triangular, in shape. The base or body of the bone is situated at the thick and narrow part which forms the upper portion of the acetabulum, and the large expansion or wing which passes from it, upward and outward, is termed the ala. The external or femoral surface of the ilium is convex, and is called the *dorsum ilii*, or *gluteal region*, having the three glutei muscles lying upon it; and presents below, in its inferior and outer part, a cavity for the head of the femur, called the acetabulum or cotyloid cavity.

The internal or abdominal portion, called the *venter* or *costa*, presents at the upper part a broad, smooth, concave surface, termed the *internal iliac fossa*, on which the internal iliac muscle is situated, and which supports the large intestine; in one of these fossæ the child's head is placed during the operation of turning. Below, is a prominent ridge or curved line, running from behind forward, that is, from the superior part of the sacro-iliac junction to the top of the pubis, forming part of the *linea ilio pectinea*, or *ilio-pubic line* which defines the superior strait. The excavation above this ridge, which is also named the *brim of the pelvis*, is termed the upper or superior basin or pelvis, while the cavity below, is termed the lesser or lower basin or pelvis, or the pelvic cavity.

The superior or upper convex edge of each wing, is called the crest, or *crista ilii;* this crest is rough and thick, for the insertion of muscles, is shaped like the letter *f*, being thicker in front and behind than in the middle, and terminates in front, in an *anterior-superior spinous process*, from which some of the muscles of the abdomen and thigh arise, and into which others are also inserted—and behind, in a *posterior-superior spinous process*, underneath each of which processes is a semicircular notch, terminating inferiorly in an *anterior* and a *posterior-inferior spinous process;* all of which processes serve as points of origin and insertion to muscles and ligaments. The surface which articulates with the sacrum is rough and irregular. Immediately below the posterior-inferior spinous process is an arched sinuosity, forming at the union of the ilium and sacrum, the *great sciatic notch*, which is two inches in depth, and terminates inferiorly, by an acute and sharp spinous process called the *spine of the ischium*, which points backward and slightly inward.

The OS ISCHIUM, *os sedentarium*, or seat bone, occupies the lower part of the pelvis, and its base or body forms the inferior portion of the cotyloid cavity, and is very thick and strong. The internal surface of this bone is smooth and slightly concave, and is called the *plane of the ischium;* it is nearly an equilateral triangle, and is three and a half inches in length. The planes of the two opposite ischia incline toward each other, forward and downward, and which convergence exerts an influence on the fetal head during labor, repelling or deflecting the vertex toward the pubic arch, as the head approaches the outlet of the pelvis.

The spine of the ischium, proceeding from the posterior portion of the os ischium, furnishes a place of attachment for the lesser sacro-ischiatic or sacro-sciatic ligament; beneath this process, is a concavity or notch, named the *lesser ischiatic*, or *sciatic notch*, in which the tendon of the obturator internus plays. Below this, is the inferior or lower portion of the ischium, or that part upon which the body rests when in a sitting posture; it is rough, thick, and strong, and is termed the *tuberosity of the ischium;* the great sacro-sciatic ligament, arises on the inside of this tuberosity, and its outside, inside, and central surfaces give origin to various muscles.

Passing obliquely from without inward, and from below upward, from the tuberosity of the ischium, is a flat process of bone called the *ramus of the ischium*, which unites with the descending branch, or ramus of the pubis, and assists in forming the pubic arch. In the female pelvis, the anterior edge of this ramus is beveled or turned outward, thus affording more space for the passage of the fetal head under the pubic arch. The opening in the anterior part of the pelvis, formed by the ischium and os pubis, is called the *thyroid, sub-pubic*, or *obturator foramen*, through which pass the obturator vessels and nerves, and to its inner side is attached the adductors and the obturator externus. This foramen is rounded in man, and triangular in woman.

The OS PUBIS, otherwise variously called the shear bone, the cross bone, the bar bone, or pecten, is situated at the inner and anterior part of the os innominatum, and is joined to its fellow of the opposite side by a union or articulation termed the *symphysis pubis.* It may be divided into, the body, a horizontal, and a descending ramus or branch. The body of each os pubis is placed transversely before the anterior part of the ilium; and from the side of the body proceeds the horizontal ramus, going outward to meet the ilium. The superior face of the os pubis is flat, and upon its outer and anterior portion is its spinous process, from which two eminences proceed, one passing outward to be lost in the acetabulum; the other, running along the inner margin of the horizontal ramus, is called the crest of the pubis, or *crista pubis.* This ridge is sharp and elevated, and forms the anterior third of the linea ilio-pectineal eminence. The descending ramus of the pubis passes downward to unite with the ascending ramus of the ischium. As with the rami of the ischia, the anterior edges of the pubic rami are beveled or turned outward, affording a sufficiently large and free opening for the fetal head to pass. The descending ramus is connected with its fellow of the opposite side, toward their origin, by a ligamentous substance, called the triangular ligament, which is a part of the interpubic ligament, binding the two pubes together, and rendering the arch of the pubis broader or lower, and also stronger. The *arch of the pubis* is formed on the anterior and inferior part of the pelvis, by the union of the two pubic rami, it is much wider in the female than in the male.

The anterior face of the body of the os pubis is concave and rough, for the origin of the adductor muscles of the thigh; its posterior surface is nearly flat and smooth, but contributing a little to favor the general concavity of the pelvis. The largest or thickest portion of the pubic bone is that employed in the formation of the acetabulum; the next thickest portion is at the symphysis pubis, from which it becomes gradually thinner as it extends toward the obturator foramen.

It will be seen that the ilium forms no portion of the inferior strait, but enters largely into the superior,—also that the ischium forms no portion of the superior strait, but only of the inferior,—while the pubic bones form a large portion of both straits. Hence a deformity of the ilium would affect only the brim; a deformity of the ischium would implicate only the outlet; but a distorted pubes, would necessarily involve each of the straits.

CHAPTER II.

SYMPHYSES AND LIGAMENTS OF THE PELVIS—THEIR MORBID CHANGES AND TREATMENT.

THE Pelvic Bones are united together by articulations and ligaments, which never separate during labor, or at any other time, so long as they are in a normal condition. The articulations are four in number, and have received the name of Symphyses, each symphysis being designated according to the bones which form it; thus, we have the *symphysis pubis*, the *sacro-iliac symphyses*, and the *sacro-coccygeal symphysis*.

The SYMPHYSIS PUBIS, or pubic articulation is formed between the bodies of the ossa pubis, the articular surfaces of which are clothed by a thick layer of fibro-cartilage; this passes across from one bone to the other, and is so strong, as to admit rather of the disruption of the bone, than of its own tissue. At the center of the symphysis, and toward the posterior third of the fibro-cartilage, are two smooth, polished, oblong articular surfaces, covered by a cartilage, and lined by a synovial membrane, which arrangement is difficult to detect in man, or even in woman, except when she has died shortly previous to, or soon after, parturition.

The ligaments which strengthen the pubic articulation are four in number; 1, the *anterior pubic ligament,* lying on the anterior face of the symphysis pubis; 2, the *posterior pubic ligament,* which is an expansion of the periosteum; 3, the *superior pubic ligament,* or *supra-pubic ligament,* which supports the superior edge of the pubes, and effaces all its inequalities; and 4, the *inferior,* or *sub-pubic ligament,* which is remarkably strong and thick, and of a triangular form; by some, it is considered as a continuation of the inter-pubic ligament. It adds greatly to the strength of the articulation, and its inferior edge constitutes the *crown of the pubic arch.*

The SACRO-ILIAC SYMPHYSIS or junction, is the articulation formed by the corresponding rough surfaces of the sacrum and ilium, and of which there are two—one on the right, and the other on the left superior lateral portion of the sacrum. Each of these articulating surfaces has a covering of cartilage, which is thicker on the sacrum than on the ilia, and between which exists a thick, yellowish fluid, which serves to lubricate the parts; and in children and pregnant women, there is said to be a synovial membrane in each joint.

The ligaments which aid in strengthening this articulation, are four in number; 1. The *posterior sacro-iliac ligament,* which fills nearly the whole of the deep excavation comprised between the sacrum and the two posterior spinous iliac processes; their union constitutes a pyramidal ligament, capable of immense resistance. This ligament arises from the posterior and inferior spinous process of the ilium, and from the margin of the sacrum and coccyx, and passes outward and downward to be inserted into the tuberosity of the ischium; it is broad at its origin, but narrow and thick at its insertion. 2. The *anterior sacro-iliac ligament,* which extends transversely from the sacrum to the ilium; it is an expansion of the periosteum of the pelvis, which passes in front of the articulation, and adheres to it but feebly. 3. The *superior sacro-iliac ligament,* which passes transversely from the base of the sacrum to the ilium; it is very thick and strong. 4. The *inferior sacro-iliac ligament,* which arises from the posterior-superior spinous process of the ilium, its superior fibers being inserted below the third sacral foramen, while the lower portion is inserted anteriorly into the tubercle of the extremity of the edge of the sacrum, and posteriorly to the great sacro-sciatic ligament.

The foregoing articulations are still further strengthened by other ligaments, and which assist also in completing the parietes of the pelvic cavity, as: 1. The *posterior*, or *greater sacro-sciatic ligament*, which arises from the internal lip of the tuberosity of the ischium, and from its ascending ramus; it is situated obliquely in the posterior inferior part of the pelvis, is contracted in its center and expanded at its extremities, and passes upward and backward to be inserted into the margin of the coccyx and sacrum, and into the posterior-inferior spinous process of the ilium. 2. The *anterior*, or *lesser sacro-sciatic ligament*, which is placed in front of the greater sacro-sciatic ligament, which it crosses; it arises from the free margin of the sacrum and from all the bones of the coccyx, and is inserted into the summit of the spine of the ischium. These two ligaments convert the great sciatic notch into two openings or foramina; the upper foramina is the largest, irregularly oval, and transmits the pyriformis muscle, the great sciatic nerve, gluteal, ischiatic, and internal pudic vessels and nerves, while the lower foramen is of a long triangular shape, and gives passage to the internal obturator muscle, and internal pudic vessels and nerves.

The *obturator*, or *sub-pubic ligament*, may likewise be mentioned; it is inserted by its internal semicircumference to the posterior face of the ascending ischiatic ramus, and by its external semicircumference to the outline of the obturator foramen. This ligament closes the obturator foramen, with the exception of an opening at its upper part, through which pass the obturator vessels and nerves. The obturator muscles are attached to the two surfaces of this membrane.

The SACRO-COCCYGEAL SYMPHYSIS, is the articulation between the apex of the sacrum and the base of the coccyx; this union is effected by a cartilaginous substance, similar to that which exists between the vertebræ, and is strengthened by two ligaments; 1. The *anterior sacro-coccygeal ligament*, which arises from the inferior extremity of the sacrum, extends over the whole anterior face of the coccyx, and is inserted into its extremity. 2. The *posterior sacro-coccygeal ligament*, which arises from the last sacral bone, and is inserted into the second bone of the coccyx. These ligaments maintain the connection of the sacrum and coccyx, and oppose all mobility or displacement. Some authors consider that they admit of motion of the coccyx in an antero-posterior direction to the extent of half an inch, and not laterally; but from the firmness with which the sacro-sciatic ligaments fasten this bone toward the os ischium, this can not be a common occurrence; beside, it is known that when the coccyx has been forcibly pressed backward during labor, great pain and suffering have been the consequence.

There are, in early life, coccygeal articulations which unite the several pieces of the coccyx with each other; their consolidation takes place more rapidly in males than in females.

There are other articulations common to the pelvis, which, however, have no direct agency with parturition, and to which it will be necessary merely to refer; they are, 1. The *sacro-vertebral articulation*, or the junction between the base of the sacrum and the inferior face of the last lumbar vertebra; this articulation is an amphiarthorosis. 2. The *ilio-femoral articulations*, or the junctions of the femoral bones with the ilia, in the cotyloid cavity.

It has long been a question whether the articulations of the pelvis are possessed of any motion. An examination of the method by which the bones are united with each other, and the solidity of their union, would lead us to consider them as perfectly immovable, at least in the ordinary conditions of life. Yet, when we reflect that they are supplied with synovial membranes, which are only found in movable articulations, we may admit them to possess, under certain circumstances, a slight degree of motion, as for instance, the shock of a fall from a hight, upon the feet, is much diminished in its influence upon the body and brain, by a slight mobility.

There is no doubt, but that during pregnancy or parturition, there may be a relaxation, or separation of the symphyses, especially of the symphysis pubis, but it is an uncommon event, and one which is seldom met with, and which, in my opinion, depends upon a diseased condition of the parts themselves, the result of falls, blows, or other causes. For were it a circumstance common to parturient women, it would be impossible for them to walk or exercise immediately previous, as well as subsequent to confinement (acts which are accomplished daily), from the fact that an appreciable degree of mobility would not only render it impossible to walk, but likewise very painful to stand. The tissues about the joints may, probably, become softer, and perhaps more movable during pregnancy and parturition, yet any appreciable relaxation or separation must necessarily be unfavorable, and owe their origin to some disease not connected with these conditions.

When relaxation does take place, the symphyses become swollen, and sometimes dilate so much as to separate the bones which aid in their formation, permitting them to glide over each other, and occasioning uneasiness and fatigue in the movements of the female, with difficulty of standing. Should labor come on, the auxiliary muscles of the uterus, not having any longer a fixed point of insertion in the vacillating bones of the pelvis, draw the symphyses apart, producing great agony; and the female, dreading the pain occasioned by their contraction, remains passive, and allows the uterus slowly and difficultly to expel its contents, unaided by her efforts. Instances of this kind have taken place, and have always proved a source of much distress and suffering, causing more or less intense pain on motion, with much difficulty in moving the lower extremities, and an inability to stand.

Occasionally, there is not only a relaxation, but likewise an actual separation of the parts, giving rise to most intense suffering, inflammation, peritonitis, and all the symptoms of simple relaxation in a more aggravated form, greatly endangering life. This separation may be *accidental*, resulting from the powerful efforts made by the patient to expedite her delivery, or it may ensue from the employment of the lever or forceps in extracting the fetal head, or even from the operation of turning to deliver by the feet. Sometimes it is *congenital*, and usually accompanies exstrophy or extroversion of the bladder, of which it may probably be the result.

There is but little protection given by ligaments to the anterior part of the sacro-iliac symphyses, the only ligament of any size being the anterior sacro-iliac; the principal ligaments are placed on the outer edge of the joint, and any tendency to open at its inner margin is prevented by the ligaments of the symphysis pubis. Hence, a separation of the pubic bones will occasion a relaxation or separation of the sacro-iliac symphyses; and when a separation takes place in consequence of the pubic junction being cut or ruptured, the sacro-iliac symphyses immediately open considerably, the effect of which is, pain, inflammation, and if not remedied, caries of the bone, suppuration of the parts, and hectic fever.

TREATMENT.—In either relaxation or separation of the symphyses of the pelvis, it will be absolutely necessary for the patient to remain quiet, and in a horizontal position for a long continued period of time; the inflammatory symptoms which may be present must be subdued by applications of either cold or tepid water, whichever may produce the most beneficial influence as determined by their employment, and emollient poultices, together with the internal means usually administered in other cases of inflammation. A decoction of White Oak Bark has been found very efficacious, when applied locally, on the subsidence of the inflammatory symptoms. The diet should be light. When the inflammation has been subdued, or in cases where there is no disposition to inflammation, the return of the inter-articular cartilages to their normal condition may be attempted, by means of bandages around the pelvis, the patient still maintaining the horizontal position; over the articulations compresses may be kept and retained there, having them constantly moistened with a decoction of White Oak Bark, or of the Root of Geranium Maculatum, or with a solution of Tannin in Port wine. The pressure of the bandage should be at first, gentle, but gradually increased. Cupping or blistering is inadmissible. The diet should be strengthening and rather generous, but suited to the condition of the digestive powers; a good animal diet is of service, and if much debility, some wine, or chalybeate draughts. The bowels should be kept regular, obtaining one evacuation every day, and never more than two. The surface of the body should be frequently bathed either with a weak, alkaline wash, or a mixture of vinegar, water and salt, and in drying, considerable friction should be made with a flannel cloth. If the general system becomes impaired, preparations of Iron, Quinia, or the officinal Compound Syrup of Stillingia, with Iodide of Potassium may be used, as the symptoms indicate. In using the latter compound, I generally add half an ounce of the Iodide, to one pint of the syrup, the dose of which is one fluidrachm, to be taken in half a gill of water, and repeated three or four times a day.

The patient should not be advised to attempt walking too soon, and when it is considered prudent to test her strength, it must be done with great care. A well padded leathern girdle, should be fixed around the hips, as tightly as the patient can bear, and kept in its place by straps passed under the thighs; the upper part of the body should also be supported on crutches, in order to lessen the weight and pressure of the trunk on the articulations, which must, at first, be unable to maintain its whole weight.

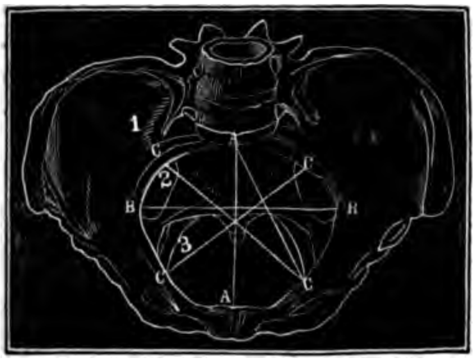
CHAPTER III.

STRAITS AND CAVITIES OF THE PELVIS.

The union of the several bones already considered by means of their symphyses or articulations, forms the Pelvis, which is of a conical shape, with its base looking upward and forward, and its apex pointing downward and inward. The internal surface of the pelvis is divided into the *upper basin*, or *greater pelvis*, located above the superior strait, and the *lower basin*, or *lesser pelvis*, sometimes termed the *pelvic cavity* or *excavation*, and which occupies the space comprised between the superior and inferior straits,—so called, because they are rather more contracted than the space between them. The greater pelvis is bounded posteriorly by the lumbar vertebræ, laterally by the alæ ilii, and anteriorly by the abdominal parietes; the lesser pelvis is marked posteriorly by the sacrum and coccyx, laterally by the ischia, and anteriorly by the pubes.

Between these two cavities is an aperture of an elliptical or curvilinear triangular form, somewhat resembling the shape of a playing-card heart, with its base resting on the sacrum, and at which location a prominent ridge is observable, which has received the names of *ilio-pubic line*, *linea ilio-pectineal protuberance*, and *brim of the pelvis;* it is formed by the crest of the pubis, and the ridge which is continuous along the lower part of the alæ ilii, and which, together with the promontory of the sacrum, constitutes the SUPERIOR STRAIT. In a well formed pelvis its circumference measures from fourteen to sixteen inches. The diameters of the superior strait, are as follows: 1. The *antero-posterior*, or *sacro-pubic*, or *conjugate diameter* (A A, *Fig.* 4), extending from the superior-posterior edge of the symphysis pubis to the promontory of the sacrum, measures from four to four and a half inches. 2. The *transverse*, or, *bis-iliac diameter* (B B, *Fig.* 4), passing from one ilium to the other, and crossing the antero-posterior diameter, at a right angle, measures five inches. In the recent subject, this diameter is lessened by the psoæ and iliac muscles, which overhang the sides of the brim. 3. The *oblique diameters* (C C, *Fig.* 4), passing from the ilio-pubal line, or side of the brim just above the acetabulum, to the sacro-iliac symphysis of the opposite side, measure, each, from four and a half to five inches. The one passing from the right ilio-pubal line to the left sacro-iliac symphysis, is called the *right oblique diameter;* and that which passes from the left ilio-pubal line to the right sacro-iliac symphysis, is called the *left*

FIG. 4.



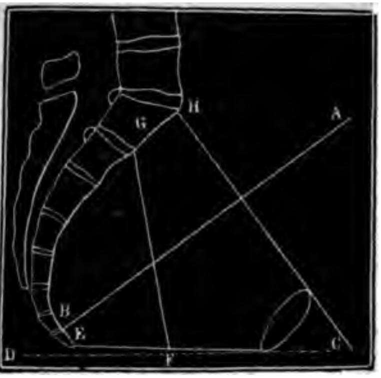
DIAMETERS OF THE SUPERIOR STRAIT.

A A. Antero-posterior Diameter.
B B. Transverse Diameter.
C C. Oblique Diameters.
A C. Sacro-cotyloid Space.

oblique diameter. 4. The *sacro-cotyloid space*, or *diameter* (A C, *Fig.* 4), extending from the center of the promontory of the sacrum, to the ridge just above the cotyloid cavity, measures from three and three-quarters of an inch to four inches.

The articulation of the spinal column with the pelvis, is such, that the axis of the superior strait is not parallel with that of the body. If a piece of pasteboard be accurately cut and fitted to the pectineal line or superior strait, it will represent the *plane* of that strait (C H, *Fig.* 5), and will be neither horizontal or vertical, but will form with a horizontal line, an angle of about 54° to 56°, varying more or less according to the position of the body. The axis of the superior strait, will, therefore, be an imaginary line passing through the center of the plane at right angles (A B, *Fig.* 5), and will be found to extend from the neighborhood of the umbilicus, downward and backward, to the central portion of the coccyx.

FIG. 5.



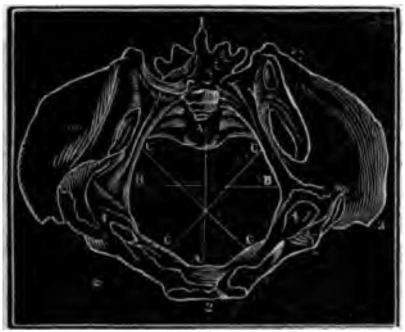
A B. Axis of the Superior Strait.
C H. Plane of the Superior Strait.
C D. Horizontal Line.
C E. Plane of the Inferior Strait.
E G. Axis of the Inferior Strait.

The INFERIOR or PERINEAL STRAIT, also termed the *outlet* of the pelvis, is bounded posteriorly by the apex of the coccyx, laterally by the inner edges of the ischiatic tuberosities, and the sacro-sciatic ligaments, and anteriorly by the rami of the ischia, and the inner edges of the pubic arch. Its circumference measures between thirteen and fourteen inches. The conformation of this strait is apparently very irregular, but if a sheet of paper be applied to it, and its outline traced by a pencil, it will be found of an oval form, with its large extremity pointed backward, and broken by the projection of the coccyx. The diameters of the inferior strait are as follows.

1. The *antero-posterior diameter* (A A, *Fig.* 6), extending from the lower edge of the symphysis pubis to the apex of the coccyx, measures four inches, but in some women it may be increased to five, in consequence of the regression of the coccyx. 2. The *transverse*, or *bis-ischiatic diameter* (B B, *Fig.* 6), extending from one tuberosity of the ischium to the other, measures four inches. 3. The *oblique diameters* (C C, *Fig.* 6), extending from the center of the great sacro-sciatic ligament of one side, to the point of union between the ascending ramus of the ischium and descend-

ing ramus of the pubis, measure, each, from four to four and a half inches. At the period of delivery, this diameter may be slightly increased, owing to the mobility of the sacro-sciatic ligaments.

FIG. 6.



DIAMETERS OF THE INFERIOR STRAITS.

A A. Antero-posterior diameter.
B B. Transverse diameter.
C C. Oblique diameters.
1. Base of the Sacrum.
2. Pubic Symphyses and Pubic Crest.
3. Anterior Superior Spinous Process of the Ilium.
4 4. Obturator Foramina.

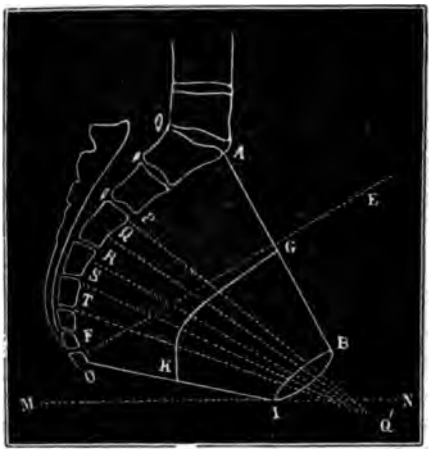
That which passes from the right lateral anterior region to the left lateral posterior, is called the *right oblique diameter;* and that which passes from the left lateral anterior region to the right lateral posterior, is called the *left oblique diameter.*

An imaginary line extending from the lower edge of the symphysis pubis to the coccygeal apex, will represent the direction of the plane of the inferior strait (C E, *Fig.* 5), and a line passing through the center of this plane at right angles or perpendicular to it, will give the direction of the axis of the inferior strait (E G, *Fig.* 5), which extends from the center of the strait to the first sacral bone, and crosses the axis of the superior strait near the center of the pelvic cavity, forming at their point of contact a very obtuse angle; it is parallel with the axis of the body. The directions of these axes of the two straits should be well understood, as they determine the direction which the fetal head takes in passing through the pelvis, and which course should be followed whenever delivery has to be effected by instruments; the curved direction of these two axes through the center of the pelvis, may be considered as the true axis of the pelvis (G K, *Fig.* 7).

In consequence of the arrangement of the pelvic bones, which causes this variation in the direction of the axes of the two straits, the pelvic contents are prevented from falling downward, which might, otherwise, be the result, either from their own gravity, or from the pressure of the abdominal viscera above them.

The PELVIC CAVITY or EXCAVATION, includes all that space occupied between the superior and inferior straits; it is bounded posteriorly by the sacrum, the coccyx, the sacro-iliac symphyses, and a portion of the sacro-sciatic ligaments; anteriorly, by the symphysis-pubis, pubic bones and the internal obturator fossæ; and laterally, by the two inclined acetabular planes, the sciatic openings, and the sacro-sciatic ligaments. The canal of this cavity possesses a curvature corresponding to the curve of the sacrum, and which gives to it a greater extent than that of the straits. The axis of this canal, represents the route taken by the fetus in its expulsion through the cavity, and should be well understood by the practitioner, if he expects to meet with success in the operations which may be necessary to effect artificial delivery. The axis of the pelvis is not formed of two straight lines, nor does it, as supposed by Carus and others, represent the arc of a circle; but it has been well determined by M. Cazeaux, who observes: (*Fig.* 7.)

Fig. 7.



A B. Plane of the Superior Strait.
I O. Plane of the Inferior Strait.
Q'. The point where these two planes would meet, if prolonged.
M N. The Horizontal Line.
E F. The Axis of the Superior Strait.
G K. The Axis of the Pelvic Cavity.
P Q R S T. Various points taken on the Sacrum to show the plane of the excavation at each point.

"To form an exact idea of the general disposition of the pelvic cavity, it seems best to cut that canal by a series of planes, passing from the point Q' (the point of intersection of the planes of the superior and inferior straits), to the points P Q R S T, of the anterior face of the sacrum. Each one of these planes will determine the opening of the pelvic cavity at that point. Now, to determine with precision the direction of the general axis of the excavation, it will be necessary to erect a perpendicular to the geometrical center of each one of these sections, and to draw a line (G K) along the extremities of these perpendiculars. This line (G K) is curved, and is called the general axis of the pelvic cavity. It is easy to see that this line is nearly parallel with the anterior face of the sacrum, and its extremities are lost in the axes of the superior and inferior strait. This curve represents exactly the axis of the whole excavation; that is to say, the line which the fetus traverses in passing through the pelvis."

The depth of the pelvic excavation, posteriorly, along the sacrum and coccyx, is from five to six inches; laterally, three and a half inches; anteriorly, along the os pubis, one and a half to two inches. Its diameters are:

1. The *antero-posterior diameter*, passing from the symphysis pubis to the center of the sacrum, measures four and a half inches, or more.

2. The *transverse diameter* extending from the plane of one ischium, to that of the other, measures about four and a half inches.°

There is considerable difference in form and texture, between the pelvis of a female, and that of a male. (*Figs.* 2 and 3.) The female pelvis is not so strong nor so thick as that of the male, and contains less osseous matter; in the male the long diameter of the superior strait, is from before, backward, while in the female it is from side to side; in the male, the brim is more triangular, in the female, more oval. In the female the ilia are more distant; the tuberosities of the ischia, are also farther apart from each other, and from the coccyx, and the space between the pubes and coccyx is greater than in the male. The sacrum of the female is broader and more curved than in the male, and the superior articulations are more distant from each other, occasioning a peculiarity in her walking, apparently rendering it more difficult for her to preserve the center of gravity. The symphysis pubis is not so long in the female as in the male, and the rami of the pubes and ischia are smoother on their inner face, and have their anterior edges turned more outwardly; the obturator foramen is more triangular in the female; and the cotyloid cavities are more widely apart.

The following dimensions of the male and female pelvis are by Meckel.

° It may be proper to remark here, that Prof. Meigs describes two planes of the inferior strait,—an *anterior plane* occupying about one-third of the anterior portion of the outlet, and a *posterior plane* comprising the remaining two-thirds of the posterior portion; these intersect each other, forming an angle of 140°. The anterior portion of the posterior inclined plane, is first depressed by the advance of the child, and then the posterior edge of the anterior inclined plane; and when the edges of the two planes become depressed, the child passes between them, after which they assume their original places.

Beside these two planes of the inferior strait, accoucheurs likewise recognize two lateral inclined planes, situated on each side of the antero-posterior median line of the interior of the pelvis. The anterior inclined planes commence at the sacro-iliac symphyses, and occupy all the space between these points and the symphysis pubis, and passing downward and forward in front of the ischiatic spines, over the obturator foramina, they terminate on the anterior edge of the pubic and ischiatic rami, and at the pubic symphysis; the posterior inclined planes commence likewise at the sacro-iliac symphyses, and occupy all the space between those points and the middle line of the sacrum, then pass downward and backward behind the ischiatic spines, over the sacro-sciatic foramina and ligaments, and terminate upon the posterior edges of the ischiatic tuberosities, the inferior edges of the sacro-sciatic, and coccygeo-ischiatic ligaments, and the coccygeal apex. They are divided into right and left anterior and posterior inclined planes, of which the anterior are the longest and widest, and occupy the greatest space in the pelvic cavity. By many authors these planes are said to exert an immediate influence upon the movements of the fetal head, effecting rotation, and directing the presenting part of the fetus.

	In the Male.		In the Female.	
	Inches.	Lines.	Inches.	Lines.
“The transverse diameter of the great pelvis between the anterior-superior spinous processes of the ilia,	7	8	8	6
Distance between the cristæ of the ilia,	8	3	9	4
Transverse diameter of the superior strait,	4	6	5	0
Oblique diameter of the superior strait,	4	5	4	5
Antero-posterior diameter of “ “	4	0	4	4
Transverse diameter of the cavity,	4	0	4	8
Oblique diameter of the cavity,	5	0	5	4
Antero-posterior diameter of the cavity.	5	0	4	8
Transverse diam. of the lower strait or outlet,	3	0	4	5
Antero-posterior diam. of the “ “ “	3	3	4	4

The latter may be increased to 5 inches, from the mobility of the coccyx.”

The above dimensions of the straits and cavity of the female pelvis are assumed as the standard, and any considerable deviation from these measurements, may present an obstacle to the progress of delivery, and the pelvis is then said to be vitiated or malformed.

It may be proper, to make a brief reference, to some of the vessels and soft parts which cover the pelvis, especially those which occupy its cavity. In the greater or false pelvis, we find anteriorly, the muscles and the anterior parietes of the abdomen, which assist in completing this basin; laterally, the iliac fossæ are filled with the internal iliac muscles; and posteriorly, are the psoas major and minor muscles, which pass downward along and on the sides of the lumbar column, and along the pelvic brim, to be inserted into the trochanter minor. These muscles, in connection with the iliac veins and arteries, are so arranged as to contract the size of the transverse diameter of the superior strait, to even an inch less than its true length, thus apparently presenting its oblique diameter as the largest; but these muscles are capable of great compression, especially when they are completely relaxed by flexing the thighs upon the pelvis, and hence in the majority of cases, they present but little obstacle to the passage of the fetus.

The pelvic excavation is lined by fascia, which assist in diminishing its diameters; it is also lessened posteriorly, by the sacral plexuses of nerves, the pyriform muscles, the hypogastric bloodvessels, and the rectum; anteriorly, by the bladder, the obturator nerves and vessels, and the internal obturator muscles; and in its vertical diameter, by the floor of the pelvis or perineum, which is a muscular membranous plane closing the pelvis inferiorly, acting in antagonism to the diaphragm and abdominal muscles, and on whose median line are the urinary, generative and fecal or anal orifices. Inclosed within these soft parts are the vagina and uterus. The muscles of the perineum, are—the *sphincter ani* surrounding the lower part of the rectum, and which arises from the coccyx, and is attached to the center of the perineum; the *sphincter* or *constrictor vaginæ*—which arises from the body of the clitoris, and is attached to the center of the perineum; it is about fifteen lines wide, and surrounds the anterior opening of the vagina, acting as a sphincter to it;—the *erector clitoridis* arises from the ascending ramus of the ischium, covers the inferior face of the crus clitoridis, and is inserted into the upper part of the crus and body of the clitoris, it draws the clitoris downward and backward;—and the *transversalis perinæi* arises from the fatty cellular membrane which covers the tuberosity of the os ischium, and is inserted into the perineal center; it keeps the perineum in its proper place.

CHAPTER IV.

DEFORMITIES OF THE PELVIS.

ANY remarkable deviation from the standard measurements of the pelvis produces a malformation or deformity of it; yet, it does not follow, that every slight variation should be viewed as deformity, but only those instances in which it may so far depart from its normal form as to render it extremely difficult, or even impossible to deliver the full grown fetus by the natural passage. A pelvis, the small diameter of which measures three and a half or four inches, may, in case there be no unusual enlargement of the fetal head, admit of its safe passage at full term with but very little difficulty; below this measurement, say from three inches to three and a half, the forceps will undoubtedly be demanded; if it be still smaller than this, the induction of premature delivery would be prudent and justifiable, and if the fetal head should be unable to pass, the perforator would be required. In cases, however, where the measurement of the small diameter does not exceed one inch and a half, the perforator can not be used with safety, and in these instances, the Cesarean section is recommended, as the only chance for the mother's life.

The more general causes of vitiated or malformed pelvis, are rickets, and mollities ossium. Rickets, is probably the most frequent cause; this is a disease common to children, especially those of a strumous disthesis, and is very seldom met with in adults. In this affection, the bones become very much softened, in consequence of the deficiency of the calcareous matters natural to them, owing to their absorption or non-deposition; and in connection with the disease there is most usually an arrest of development of the bones, in which the pelvis, instead of becoming properly developed with the growth of the female, retains its infantile condition, and thus presents a permanent obstacle to delivery. From these circumstances, the bones curve unnaturally in various directions, especially those upon which there is much pressure, or upon which is exerted a long continued action of the muscles; and the pelvis in particular, which sustains the weight of the trunk, becomes more or less deformed, according to the duration and severity of the disease, and the deformity continues even after the disease has been cured. Most generally this disease commences in the bones of the inferior extremities, and gradually extends itself to the pelvis, the spinal column, etc.

TREATMENT.—Children, therefore, who are affected with rachitis, should be kept in a state of rest, in a reclining position; the bed on which they rest should be soft, and made of the leaves of Sweet Fern (*Comptonia asplenifolia*), and Dogwood (*Cornus florida*), which exert a beneficial influence on the disease; the limbs and body should be frequently bathed with salt and water, or brandy and salt, to be applied with considerable friction. The diet should be principally animal, and the medication which I have found the most advantageous, is the administration of Phosphate of Iron, from two to four times a day, in connection with the following compound; Take of the roots of Buckhorn Brake (*Osmunda regalis*), bruised, four ounces, Solomon's Seal (*Convallaria multiflora*), bruised, two ounces, Boiling Water enough to reduce the whole to a paste of a little more consistence than the white of egg. To this add Comfrey root (*Symphytum officinale*), Yellow Dock root (*Rumex crispus*), Bittersweet, bark of root (*Celastrus scandens*), Prickly Ash berries (*Xanthoxylon fraxineum*), Caraway Seed (*Carum carui*), of each, finely bruised, one ounce, White Sugar, two pounds, best French Brandy, three pints. The dose of this compound, is from a fluidrachm to a fluid ounce, three or four times a day, according to the age of the patient. A liniment applied to the joints and along the spine once or twice a day will be found valuable in this affection; I usually employ the following: Linseed Oil, two ounces, Oil of Sassafras, Oil of Wintergreen, Oil of Origanum, Gum Camphor, of each one ounce. Rub together in a glass or Wedgwood mortar.

Children, and especially female children, who are disposed to rickets, should never be allowed to creep or walk at too early a period, lest pelvic deformity occur as a consequence.

Mollities Ossium, or *Malacosteon*, is the usual cause of those deformities which take place during adult age. It also consists in an undue softening of the bones, owing to the absence of their salts, especially the phosphate of lime, and is usually connected with a gouty or rheumatic diathesis; sometimes it is the result of mercurial treatment. This disease is gradual in its progress, and the deformity resulting from it, may occur in women who have previously given birth to several children, and who may subsequently become so deformed in the pelvis, as to render delivery by the natural passage, absolutely impossible.

The cause of the deformity, in either rickets or mollities ossium, is essentially the same; thus, the sacrum being softened by either disease, will from the superincumbent pressure, be forced from its natural position, occasioning an increase or decrease of the pelvic diameters, at the superior strait, inferior strait or in the pelvic cavity. Or the oblique diameter of the pelvis, or its antero-posterior diameter may be diminished, in consequence of the acetabula being driven inward; these alterations may exist singly, or may be variously combined.

In cases of Mollities ossium, the TREATMENT will be similar to that named for rickets, with the addition of the internal administration of the officinal compound Syrup of Stillingia, to each pint of which, half an ounce of Iodide of Potassium must be added. However, the disease is seldom cured.

Deformities of the pelvis may arise from other causes than those to which I have just referred; thus, the very erroneous practice of forcing children to walk, by means of go-carts, baby-jumpers, and the like, may at an early age give rise to malformations which will continue irremediable through life. When children are allowed to walk voluntarily, gradually perfecting this exercise as their locomotive organs acquire energy, strength and development, deformities rarely occur. A child carried constantly on one arm, may cause a malformation, and I am acquainted with a lady, who has a deformed pelvis, originating from carrying her mother's children, during her girlhood, constantly resting them on the one hip. Carrying heavy burdens in early life, or remaining too long in one position, before the bones have acquired the necessary firmness, are very apt to cause this kind of malformation.

An old unreduced luxation of the femoral bones, caries of the bones, exostoses, the result of syphilitic or rheumatic affections, imperfectly consolidated fractures, and pelvic tumors may contribute to deformity of the pelvis, or occasion a diminution in its capacity. Sometimes it is impossible to determine the origin of the deformity.

Pelvic deformity is more common to the females of Europe than to those of this country—which is probably owing to the fact, that our countrywomen are better nourished, take more healthful exercise, and are not exposed to the many causes common to Europe, which contribute to destroy health among the working and indigent classes. Many of the cases which are met with in this country are among females, whose early life was passed in some portion of Europe. But, there is no doubt, that as our population increases, together with an increase of poverty, factory-working, etc., these results will cease to be uncommon among us.

The various forms given to the pelvis by the above causes, are very numerous, and must ever vary, according to the multitudinous local accidents, severity and duration of the causes, etc., and to enter into a minute description of them, or to arrange them into distinctive classes, is almost impossible, nor, indeed, is such an attempt absolutely necessary. Some of the more common deformities, have, however, been classified by authors as follows: 1st. The abnormally large pelvis, or where there is an excess of dimension; 2d. The dwarfish pelvis, or where there is a diminution of dimension; 3d. The unequally contracted pelvis; and 4th. The obliquely distorted pelvis.

1st. The *abnormally large pelvis* or excess of the dimensions of the pelvis. This can not properly be termed a deformity, yet its presence may give rise to many accidents, which it is the duty of the accoucheur to prevent or relieve. Females, in the unimpregnated state, in whom this condition exists, are very liable to various uterine displacements, which often prove extremely difficult to remedy. And during pregnancy, from the absence of due support to the uterus above the superior strait, this organ readily descends into the pelvic cavity, producing a sense of weight, with various painful and unpleasant symptoms; as painful or difficult micturition, constipation, obstinate tenesmus, hemorrhoids, pains, cramps, etc., the necessary result of compression of the bladder, rectum, and the bloodvessels and nerves which line the pelvis, by the enlarged and prolapsed uterus.

Again, during parturition, and especially if the female should exert herself by bearing down before the os uteri be suffici uterus may be forced through the inferior strait; or, dilatation being perfected, together with frequent and energetic uterine contractions, the fetus, from a want of proper resistance, may pass easily through the pelvic straits and cavity, and suddenly present itself at the perineum, which has not yet been sufficiently distended, and lacerate it. Or, should the perineum yield without laceration, the sudden evacuation of the uterus, renders the female exceedingly liable to hemorrhage, inversion, or other accidents. These inconveniences, however, may be readily obviated by a careful practitioner; the recumbent position during the first months of pregnancy and during labor, will generally overcome them.

2d. The *dwarfish pelvis*, or diminution of the dimensions of the pelvis. This deformity, although not very common to this country, is occasionally met with. The pelvis retains the proper form and dimensions externally, yet its internal cavities are very much diminished in extent, varying from a quarter of an inch to an inch, in each of the diameters. This kind of deformity, is not connected with rickets nor malacosteon; nor can it be attributed to arrest of development, as the pelvis is usually well formed, and bears no resemblance to the undeveloped pelvis of the child; its causes are not well understood.

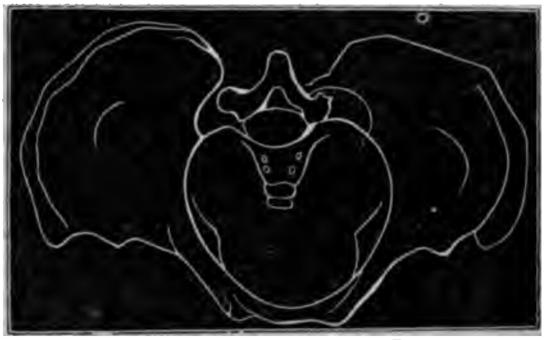
The difficulty in giving birth to a child, depends entirely upon the degree of deviation of the pelvic dimensions from the standard size, and the proportions existing between the diameters of the fetal head and the pelvis; yet a pelvis smaller than the average size, may occasion no other difficulty, than a tedious, disagreeable, painful, and perhaps exhausting labor.

The diagnosis of this deformity is always difficult to correctly determine, unless we have had its existence indicated by a previous labor, and in cases where we suspect its presence from the size of the patient, a certainty may be acquired by an examination. All the diameters of the pelvis are equally contracted in the dwarfish pelvis, hence it has been termed "the equally contracted pelvis," and as no favorable changes can be effected in consequence of the impossibility of bringing the long diameter of the head to correspond with the long and uncontracted diameter of the pelvis, as in the unequally contracted pelvis, very great obstacles to delivery are presented, and most labors result fatally to both mother and child.

3d. The *unequally contracted pelvis*, or partial deformities, in which there is a great alteration or disproportion between the various parts.

so that during labor, the female is subject to much suffering, and even death, and the practitioner frequently becomes embarrassed. The deformity may exist in the greater pelvis, the lesser pelvis, the superior strait, the inferior strait, or in two or more of these united.

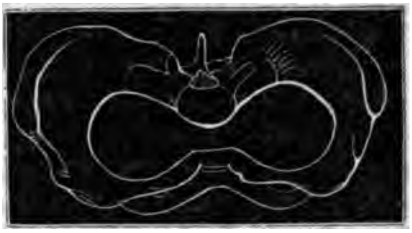
FIG. 8.



ELONGATION OF THE ANTERO-POSTERIOR DIAMETER OF THE SUPERIOR STRAIT.

The most usual malformations in the greater pelvis are an exaggeration of the curvature of the lumbar column, presenting a deviation or projection of its anterior surface; or the wings of the ilia, or the iliac fossæ may be turned too much outwardly. These deformities do not materially affect either pregnancy or parturition, although when excessive, they undoubtedly influence the presentations of the fetus, and sometimes occasion a permanent obliquity of the uterus, which may prevent the natural expulsion of the child. (*Figs.* 8 and 9.)

FIG. 9.



DIMINUTION OF THE ANTERO-POSTERIOR DIAMETER OF THE SUPERIOR STRAIT, AND ELONGATION OF THE TRANSVERSE DIAMETER.

The lesser pelvis, or pelvic cavity, may be deformed by a deficiency or excess of one or more of its diameters, and which must, consequently, influence in a greater or less degree, the diameters of the superior and inferior straits—more frequently those of the superior strait.

The antero-posterior diameter of the superior strait may be affected by the advancement of the promontory of the sacrum toward the center of the strait, in which case we usually find an excessive curvature of the sacrum, which is sometimes so great, that its apex looks up toward the pubic arch, interfering with the antero-posterior diameter of the inferior strait; or, while the base of the sacrum diminishes the antero-posterior diameter of the superior strait, in consequence of its abnormal projection, its apex may be thrown backward, and thus increase the same diameter of the inferior strait. Sometimes the sacrum may be unchanged, but the pubes will be found retreating toward the sacrum, diminishing the antero-posterior diameter of the brim; at other times, both the change in the sacrum and pubes may exist simultaneously.

The transverse diameter of the superior strait may be diminished in consequence of one side of the pelvis being much narrowed—or the horizontal rami of the pubes may approximate toward each other, becoming nearly parallel, and with this there may likewise exist an approach of the iliac bones. The forward projection of the pubes caused by this deformity, increases the antero-posterior diameter of the brim. A diminution of the transverse diameter of the brim, is seldom accompanied by an increase in that of the inferior strait; although it may be present where the contraction is the result of an upward and backward dislocation of the femur, drawing the ischiatic tuberosities and pubic rami more distantly apart. The transverse diameters of both straits may be lessened by improper pressure upon the pelvis at a time when, in consequence of disease, the bones are softened.

The oblique diameter of the superior strait may be decreased by one side of the pubes projecting inwardly, while the other projects outwardly, or the iliac bones may turn inwardly. If in the first deformity, the long diameter of the fetal head presents in the direction of the great oblique diameter of the brim, and the transverse occupies the diminished diameter, labor may terminate safely without artificial assistance.

The superior strait may not be at all changed, while the inferior strait is much diminished; thus, the antero-posterior diameter of the inferior strait may be lessened by the apex of the sacrum turning within and upward toward the pubic arch; or the coccyx may project forward too much.

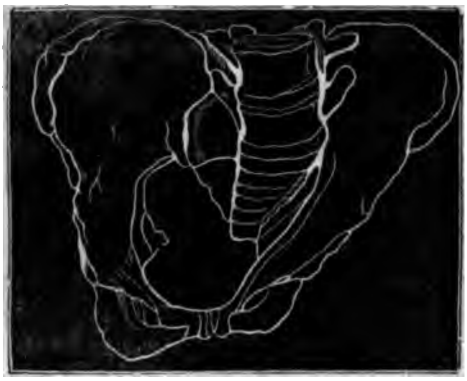
The transverse diameter of the inferior strait may be contracted in consequence of the approach of the ischiatic tuberosities toward each other, as well as of the sides of the pubic arch, which will render it absolutely impossible for the head of the child to pass, or even the hand of the accoucheur. This deformity is the most to be dreaded; the head readily passes through the brim and pelvic cavity, and becomes arrested only at the outlet, and the practitioner, after delaying for a length of time, in hope of its expulsion, is finally obliged to employ the forceps or perforator.

The oblique diameters of the inferior strait may be changed by the maldirection of the ischio-pubic branches.

These malconformations of the two straits may exist singly, and sometimes in combination, but in opposite directions; thus, if one strait be contracted, the other will be enlarged. The consequences which must arise from these various changes, will be evident to the student who compares the diameters of the child's head with those of the bony passages through which it must pass.

The pelvic cavity may be deformed, 1st, by a turning backward of the pubes; 2d, by the abnormal length of the symphysis pubis, which retards delivery by preventing the head from engaging in the arch of the pubes; 3d, by the too great or small curvature of the sacrum; 4th, by exostosis, and fibro-cartilaginous morbid productions. Various other forms, than those referred to, may be assumed by the pelvis, which, however, can not be satisfactorily classified, as they must ever vary, according to circumstances.

FIG. 10.



OBLIQUELY DISTORTED PELVIS,

In which the antero-posterior diameter traverses from the promontory of the sacrum to the left acetabulum; the left oblique diameter is also lessened, while the right is normal.

4th. *The obliquely distorted pelvis.* (*Fig.* 10.) This deformity is usually dependent upon an arrest of development of one or the other side of the sacrum; more generally the right side, and which occasionally extends to, and includes the ilium. Nægelé was the first writer who seems to have noticed this deformity, and of whose remarks M. Cazeaux has given us the following in his work on Midwifery, translated edition, p. 484:

"The peculiar characteristics of these deformed pelves are as follows—

"1st. Complete anchylosis of one of the sacro-iliac symphyses, or partial fusion of the sacrum and one of the iliac bones.

"2d. Arrest of development, or defective development of the lateral half of the sacrum, and defect in the amplitude of the anterior sacral foramina of the anchylosed portion.

"3d. On the same side, diminished length of the ilium, with diminution in the extent of the sciatic notches of this bone; that is to say, the distance from the anterior-superior spinal process of the ilium, to its posterior-superior spinous process, as also the length of a line drawn from a point at the pelvic inlet, corresponding with the sacro-iliac junction, if it existed, along the linea innominata, and the linea ilio-pectinea to the symphysis pubis, are shorter than the (same distances) on the other side. But farther upon the anchylosed bone, the part corresponding with the articular surface, which is continuous without interruption, with the sacrum, is not so high, and descends to a shorter distance than it does on the opposite side, and than it would do in a bone normally formed; or to express myself more clearly, if on the anchylosed side we suppose the ilium and sacrum separated, or reunited only by the interposition of a fibro-cartilaginous disk, such as exists in the normal joint, the articular surface or the reunion of the two bones would be found less long, and would descend less low than it would on the non-anchylosed side, or upon the pelvis normally constituted.

"4th. The sacrum seems to be pushed toward the anchylosed side, and it is toward that side that its anterior face is more or less turned, while the symphysis pubis is pressed toward the opposite side, a disposition which prevents the symphysis pubis from being directly opposite the promontory of the sacrum, and gives it an oblique direction.

"5th. On the anchylosed side, as much of the internal surface of the ilium as concurs to the formation of the pelvic excavation is flattened, and where considerable vitiation exists, it is almost entirely plane, so that a line drawn from the middle or even from the posterior end of the linea innominata, along the body and the transverse branches of the pubis to its symphysis, will be nearly straight. We have never seen at the lateral half of the anterior wall of the pelvis, of which we now speak, any inclination inward, nor have we ever especially noticed that sort of fracture of the horizontal branch of the pubis, which is observed in pelves deformed from the effects of malacosteon in adults.

"6th. The other lateral half of the pelvis, that is to say, the one in which there exists a sacro-iliac synchondrosis, also differs from the normal condition. At first sight, in examining the pelvis under consideration, and especially where the obliquity is considerable, it is easy to induce oneself to believe in the normal conformation of the non-anchylosed half; but this opinion is not correct; thus, let us suppose two pelves equally contracted, with this difference only, that in one the *left* sacro-iliac symphysis is anchylosed, in the other, the anchylosis is on the right side; let a section of each be made so as to pass through the middle of the sacrum and the symphysis pubis—if now we undertake to fit the right half of the first pelvis to the left half of the second, so that the cut surfaces shall cover each other, we will discover that the pubic bones are separated by a distance of from eight to twelve lines. Thus the lateral half of the pelvis, which is free from anchylosis, participates not only in the abnormal situation and direction of the bones, but also in their irregular form, in such a way that in measuring this half, a line drawn from the center of the promontory of the sacrum, along the linea innominata, and pectinea, to the symphysis pubis, would be at its posterior half more curved, and at its anterior half less curved than in a pelvis well formed.

"7th. It follows from this, that the pelvis is obliquely contracted, that is to say, in a direction which would intersect a line passing from the anchylosed joint to the cotyloid cavity of the opposite side, while the extent of the last-mentioned line is not diminished but may be increased where the obliquity is very marked. In consequence of this, the shape of the superior strait (that is to say, an imaginary surface passing along the linea innominata and the linea pectinea over the sacrum), and the shape of the middle of the excavation (situated midway between the superior and inferior strait, called the *apertura pelvis media*), would both resemble, properly speaking, an oblique oval when examined in front—the transverse or small diameter of which would be represented by the contracted oblique diameter of the pelvis, while its great or longitudinal diameter would correspond to the other oblique diameter. On this account we may, as far as the form is concerned, term this variety of pelvic deformity the *obliquely oval pelvis.*

"That the distance from the sacral promontory to the point corresponding to one or the other cotyloid cavity (the distance sacro-cotyloid), as well as the distance from the obtuse point of the sacrum to the spine of the ischium on either side, is less on the side where the anchylosis exists.

"The distance from the tuberosity of the ischium on the side of the anchylosis to the posterior-superior spinous process of the ilium of the opposite side, as well as the distance between the spinous process of the last lumbar vertebra, and the anterior-superior spinous process of the ilium on the side of the anchylosis, are smaller than the same measurements on the opposite side.

"The distance from the inferior edge of the symphysis pubis to the posterior and superior spinous process of the ilium, when the anchylosis exists is greater than that extending from the same point of the symphysis pubis to the posterior-superior spinous process, of the opposite side.

"The walls of the pelvic excavation converge, in a certain oblique manner, from above downward, and the pubic arch is more or less contracted, so as to give it a resemblance to the male pelvis. These two conditions, as well as the contraction of the sciatic notch, the diminution of the distance existing between the spines of the ischium, and the one-sided and defective development of the sacrum, bear a direct proportion with the degree of obliquity.

"Finally, on the flattened side, the cotyloid cavity is placed more directly in front than is observable in the normally-formed pelvis, while on the opposite side, it looks almost directly outward, in such a way, that when examining the pelvis in front, the eye rests directly upon the cotyloid cavity of the flattened side, while the edge of the one, on the other side, can only be seen, or at least, very little of its cavity.

"In order to give to those who never have seen a pelvis of this kind, as accurate an idea as possible, we will remark that when first seen, they give us the impression that the deformity has been occasioned by a pressure acting from above downward, and from without to within, in an oblique direction upon one of the lateral halves of the anterior pelvic walls, and upon one of the cotyloid cavities, while, at the same time, the other half seems to have been compressed on its posterior portion from without inward.

"Another peculiarity of this variety of deformed pelvis is, that they differ from each other only in the degree of their obliquity, and at the point where the sacrum is soldered to the ilium, while in every other respect (that is to say, in reference to the principal peculiarities of the deformity), they resemble each other as much as two eggs. It is on this point that a skillful person, not knowing this peculiarity, would be disposed to take two different specimens, presented to his inspection, for the same, and it would be difficult to convince him of his error.

"The condition of the bones of the pelvis (exclusive of the variations already mentioned), as it regards their strength, their volume, their texture, their color, etc., is exactly similar to that of healthy bones, such as are observed in young persons exempt from all deformity. It is for this reason that we find on these bones, none of the signs, either as it regards form, etc., which are met with, as the consequence of rickets or malacosteon of adults. If we divest our mind of the existing deformities, the pelves which we have seen, would seem to resemble, in general, the healthy pelvis. The majority of them belong to the medium-sized pelvis, while the others are either under or over the average size. In no case that we have specially noticed, have we discovered the least sign of the existence of rickets; in none, have there appeared any of the phenomena, or accidents, or morbid modifications, which usually precede or follow the English disease, or the mollities ossium after puberty. Nowhere have we been able to establish the injurious effects of external causes, such as falls, blows, etc., and never has there existed any antecedent pain. It has not been proved, in any of the cases which we have specially examined, that there existed any lameness. In one case only, we thought in seeing the person walk, we observed a slight limp, but other *connoisseurs* present at the examination, did not observe it, and the parents, and all the family of the person in question, assured us positively, that they had never remarked any lameness.

"In the pelvis of this kind, with the lumbar vertebræ attached, the vertebral column was straight in the lumbar region; in other cases, it inclined to the side exempt from anchylosis. In all the pelves of our collection, provided with lumbar vertebræ, the anterior face of the bodies of the vertebræ was more or less turned toward the anchylosed side."

The anchylosis of the sacro-iliac symphysis, above-named, as a peculiarity of this deformity, is usually so perfect, that the articulation can not be discovered; and the two bones appear as one, without any perceptible line of demarkation between them.

CHAPTER V.

INDICATIONS OF MALCONFORMATION OF THE PELVIS.

UNDOUBTEDLY the greatest earthly happiness consists in a domestic life, where harmony and co-operation can be maintained; and there is nothing so truly calculated to imbitter it, and render it a source of constant wretchedness to husband, wife, and relatives, as a knowledge of the existence of pelvic malconformation in the wife, rendering her incapable of giving birth to a full-grown fetus; and to determine such conformation and capability, in the otherwise marriageable female, physicians are often consulted. It is, therefore, highly desirable that every practitioner should be thoroughly acquainted with all the symptoms and indications necessary to determine the *presence* as well as the *extent* of a pelvic deformity—for should he decide incorrectly, from lack of proper information, and thus cause the parties to engage in a contract for life, the responsibility of the death of the female, accruing therefrom, would rest solely upon him. Or, as is sometimes the case, the pregnant woman may require his knowledge to correctly ascertain the extent of malformation, that a course may be pursued to preserve both the parent and child, if possible — at all events the mother — also, whether there would be safety in allowing gestation to continue its full term, or, in the induction of premature delivery.

Various causes may give rise to a suspicion of pelvic deformity, as the pre-existence of rickets, fractures, unusual shortness of the inferior extremities, or an inequality in their length, as well as an inequality in the hight of the hips, etc.; a short female with long arms, when compared with the rest of the body, projecting chin, and short, crooked legs, has also been named among those disposed to pelvic malformations.

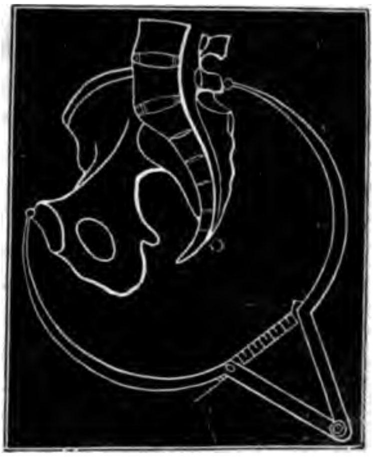
In the investigation of this matter, the physician should make himself as thoroughly acquainted as possible with the previous history of the patient, even from her infancy; the presence of scrofulous symptoms, or rickets, or any lameness or difficulty in walking at any antecedent period, must be carefully inquired into; and if there should be found any spinal curvature, or shortening or incurvation of the inferior extremities, the age at which these changes occurred should be noticed: though it must be remembered, that pelvic deformity is by no means a constant accompaniment of either of these last named conditions. In sixty-nine cases of spinal deformity, reported by M. Bouvier, there were but twelve cases where pelvic deformity was present. Should there be present an inequality in the length of the inferior extremities, it must be ascertained whether this arises from dislocations, or improperly united fractures independent of rickets, or whether it be owing to rickets, or mollities ossium.

The above indications, however, though they may occasion a suspicion of some existing deformity, are, of themselves, insufficient to give a precise idea of its extent or character; yet when they are present, they afford competent grounds for further and more accurate examination. For this purpose there are various methods recognized; as the measurement of the pelvis by instruments designed therefor, termed *callipers*, or *pelvimeters*; or by the employment of the hand. The first is termed *instrumental pelvimetry*, the latter, *manual pelvimetry*; and by the term *pelvimetry* is understood, a process having for its aim the measurement of the various diameters and extent of the pelvis.

The principal object for which pelvimeters have been used, is to ascertain the capacity of the superior strait, which is the fetal entrance to the pelvis, and more particularly, the extent of its antero-posterior diameter, though the dimensions of other parts may likewise be determined by some of them. The pelvimeters most usually employed, are Coutouly's, Stark's, Baudelocque's, Mad. Boivin's, Simeon's, and Stein's; some of which are for *external* pelvic measurement, and the others for *internal*.

Baudelocque's pelvimeter [illegible] tion, and is most commonly preferred [illegible] purpose. It

FIG. 11.



BAUDELOCQUE'S PELVIMETER.

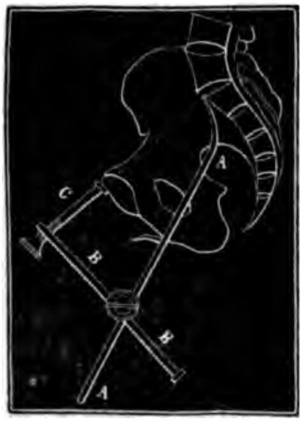
(*Fig.* 11), consists of two movable metallic branches or arms, curved externally in a semicircular form, and of sufficient concavity to embrace the hips, or antero-posterior diameter of the pelvis. One extremity of these arms is straightened for the distance of about five inches, and, at its superior portion, is attached to its fellow by a hinge, while the other, or free extremity, terminates in a knob, or button. At the inferior portion of the straightened arms of the compass, commences its curvature, and at this point a graduated scale is attached, which moves in a groove, and indicates the degree of separation of the free extremities. The instrument should always be applied to the naked body. In an examination, one of the knobs must be placed on the first spinous process of the sacrum, which will be found a short distance below the hollow of the loins, and the other must be placed on the symphysis pubis, or in the separation of the labia majora at the most elevated point of the anterior commissure of the vulva; and in effecting this, the skin must be carefully drawn upward, so as to reach, as nearly as possible, the upper part of the symphysis pubis, or else, an error of several lines may be made. This position of the instrument indicates the distance from the posterior edge of the spinous process of the sacrum to the anterior surface of the symphysis pubis, which, in a well-formed pelvis, will be seven inches. But, in order to determine the precise extent of the antero-posterior diameter of the superior strait, the thickness of the sacrum, two and a half inches, as well as that of the symphysis pubis, half an inch, must be subtracted from the external measurement, seven inches, and which will give four inches as the length of the diameter sought.

From the fact, however, that the knob of the posterior extremity can not always be correctly placed upon the first spinous process of the sacrum, and that there is more or less variation in the thickness of the soft parts over which the instrument is to be applied, as well as of the bones, and especially in the latter cases, where there has been an arrest of development, the measurement of the antero-posterior diameter of the superior strait, obtained by Baudelocque's pelvimeter, cannot be depended upon as being definitely certain; neither can the instrument be rendered useful in the detection of other varieties of malformation, whether dependent on exostosis, projection of the sacral promontory, or other causes. And although its use is recommended in cases where minute accuracy is not required, and in those unmarried females in relation to whose pelvic dimensions the physician is consulted, in each of which instances its employment may aid us in our diagnosis; yet a reliance solely upon its indications is, under all circumstances, exceedingly imprudent and hazardous.

These objections to Baudelocque's pelvimeter, occasioned the invention of *Coutouly's pelvimeter*, which, unlike the former, is designed for the internal measurement of the pelvis. It is composed of two straight steel arms, parallel with each other, and which slide with equal facility the one upon the other; these terminate in two raised extremities, and when introduced into the vagina, one of the extremities is applied against the symphysis pubis, and the other against the promontory of the sacrum; the application of which, however, is exceedingly difficult to effect with accuracy. To the horizontal branch is attached a scale, which indicates the exact amount of separation of the two extremities. The introduction of this instrument is difficult, always attended with more or less pain, and rather disgusting to female delicacy; all of which render its employment very objectionable.

The pelvimeter of Coutouly has undergone several modifications, though the same objections still remain. The improvement of this instrument, by Professor M. Van Huevel, at Brussels, is considered superior to any other; the following description of it is given by Tucker:

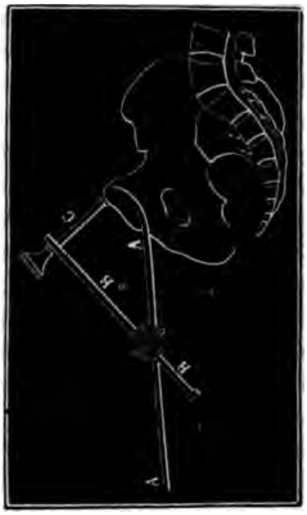
FIG. 12.



VAN HUEVEL'S PELVIMETER.

"This instrument is composed of two metallic rods, A A and B B (*Fig.* 12), united by means of a joint, so arranged as to allow the extension of the rods at pleasure, at the same time that this joint may be tightened by means of a nut-screw. The rod A A, intended to be introduced into the vagina, is curved anteriorly, and flattened at its extremity in the form of a spatula; the other rod, B B, is not so long, and is traversed at one extremity by a rod, C, movable backward or forward, by means of a screw. In applying this instrument, the female is placed upon her back, with the legs and thighs well flexed, and separated as widely as possible. The point on the skin corresponding to the upper edge of the symphysis pubis, should be marked with a dot of ink; at the same time, a similar mark may be made to designate the position of the ilio-pectineal eminence, for the purpose of measuring the oblique, as well as the antero-posterior diameter of the superior strait. This being done, one or two fingers should be introduced into the vagina, and placed against the sacral promontory; when this has been found, the internal rod, A A, is to be inserted into the vagina, and carried along the fingers to the promontory of the sacrum, against which the broad extremity of the rod is to be placed. In this position it may be firmly held by hooking the thumb of the hand introduced into the vagina, over the hook attached to the rod A A. When this rod has been accurately placed, the button extremity of the rod C, should be fixed upon the dot of ink, indicating the superior edge of the symphysis pubis. When the point of union between the two rods has been made firm, by tightly screwing the nut, the instrument may be withdrawn, and the distance from the extremity of the rod C to that of A A, may be ascertained. But in order to obtain the length of the sacro-pubic diameter, we must subtract the thickness of the pubis, and to do this, it must be measured by re-introducing the instrument, as is seen in *Fig.* 13. The distance first ascertained, minus the thickness of the pubis, will give us the exact length of the antero-posterior diameter of the pelvic brim.

Fig. 13.



Van Huevel's Pelvimeter.

"The length of the oblique diameter may be ascertained in a similar manner. In this case, the extremity of the rod A A, must be placed against the sacro-iliac junction, while that of the rod C will rest on a point a little external to the iliac artery. If the sacro-iliac junction cannot be reached, we may measure, instead of the oblique diameter, the distance sacro-cotyloid, which will give us every measurement of importance, since, where the oblique diameter is contracted, it is due (except in some cases of exostosis), not to compression inward of the sacro-iliac joint, but to that of the sacral promontory or the cotyloid cavity.

"This instrument may be employed also in measuring the pelvis externally, but its application in this case is too simple to require farther explanation."

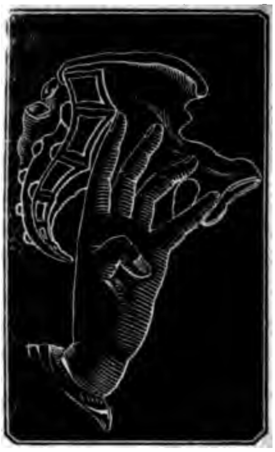
The other pelvimeters, by Stein, Simeon, and Mad. Boivin, are somewhat similar in construction to those just named, and are liable to the same objections. The pelvimeter of Stark, is rather simple in its formation, but is decidedly objectionable, on account of its application requiring the introduction of the whole hand within the vagina, which would be exceedingly improper in an unmarried female; beside which, in a small or deformed pelvis, much pain and difficulty must necessarily attend its use.

All artificial pelvimeters are liable to more or less inaccuracy, and in some instances are of no use at all; still we should not omit their employment in those cases which come before us for examination, as they will usually afford some aid toward forming a correct diagnosis. The hand, and, under certain circumstances, the index finger of the accoucheur, when skillfully introduced into the vagina, is undoubtedly the most certain and accurate pelvimeter we have, and can be employed with all females, whether married or not. I am aware, that writers generally oppose the use of the finger in the examination of the unmarried, and would impress it upon all practitioners as a correct rule by which to be governed, more especially in this country, where pelvic deformities are rarely to be met with; but when the female has arrived at the marriageable period, and is about to enter into wedlock, yet doubts are entertained as to the perfect formation of the pelvis, and the other indications lead us strongly to suspect some defection, we should not hesitate a moment in performing a manual exploration, considering the future health, happiness, and life of the individual of too much importance to herself, her friends and society, to be trifled away by an unwise regard to customs or opinions, which are only strictly applicable to the healthy, and those of perfect conformation.

In the manual examination, it is preferable to have the female standing erect, with her shoulders against the wall; the index finger, having been previously oiled, should then be carefully introduced into the vagina, with the end of the finger pointing upward and backward, in the direction of the promontory of the sacrum. If, when the radial portion of the finger has reached the lower edge of the symphysis pubis, the sacral promontory cannot be felt, we may safely determine that this diameter of the superior strait, the antero-posterior, is not deformed; but if the sacral promontory can be felt, a mark should be made upon the finger, at its point of contact with the symphysis pubis, and then withdrawing it, the distance between the mark and extremity of the finger will give us the exact measurement of this diameter, if we deduct from it six lines, for the thickness of the symphysis pubis, and two or three lines for the obliquity of the measurement.

But this is only useful where the pelvis is much distorted, or where the antero-posterior diameter of the brim is less than three inches. Other methods have been advised, where greater accuracy is required, such as the introduction of the whole left hand within the vagina, to such a distance that the external edge of the little finger may be placed against the inner surface of the symphysis pubis, and the first finger against the promontory of the sacrum. As the hand must be opened, after having entered within the vagina, the practitioner can ascertain both the antero-posterior and transverse diameters, by knowing whether the whole width of the digital extremities of the hand can be introduced into the space under investigation — whether he must spread his fingers to touch the extreme limits of the diameters — or, whether he can only introduce two or three fingers. In the first instance, the diameters will be equal to the width of the digital extremities of the hand; in the second, they will be more than three inches, and perhaps four; and in the latter, the measurement will be from one and a half to three inches, according to the measure of the fingers introduced. (*Fig.* 14.)

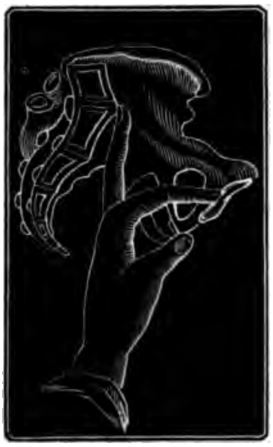
Fig. 14.



Manual Pelvimetry.

The distances between the ischiatic tuberosities can be ascertained by moving the finger from side to side, or by means of a pair of compasses applied externally. The finger can likewise measure the antero-posterior diameter of the inferior strait, by applying its radial portion to the symphysis pubis, with the extremity pointing toward the apex of the coccyx. The transverse and oblique diameters of the superior strait may also be ascertained, sufficiently accurate for all practical purposes, by carefully examining the circumference of the brim with the finger, in cases where this is practicable. The length of the symphysis pubis, the curve of the sacrum, the projection of the spine of the ischium, the shape of the straits, the condition of the lateral parietes of the cavity, and the presence of any tumor within the pelvis, can always be decided by the finger much better than by any instrument. And in cases where the fetal head does not advance during labor, the finger can readily determine the space existing between the circumference of the head and that of the pelvis, and thus instruct us whether the pelvis be sufficiently proportioned, or not.

FIG. 15.



MANUAL PELVIMETRY.

In cases where the child's head is somewhat protruded into the pelvis, even when the brim is contracted, and the hand can not, in consequence, be carried up to make an accurate examination, Ramsbotham recommends two fingers of the left hand to be introduced within the vagina, the extremity of the first finger being placed exactly behind and against the symphysis pubis, and the tip of the second against the sacral promontory. If the examiner will then carefully withdraw the fingers, keeping them steady, the distance between their extremities may be measured on a scale of inches, or otherwise, and thus give the exact dimensions of the antero-posterior diameter. (*Fig.* 15.)

CHAPTER VI.

THE FETUS, ITS DIVISIONS AND DIMENSIONS.

IN order to understand the mechanism of labor, beside having a knowledge of the pelvis and its divisions, it is likewise necessary to become well acquainted with the dimensions of the various parts of the fetus, especially those which, from increase of size, may render it difficult, or even impossible for labor to progress. Accoucheurs generally divide the fetus into three distinct parts, namely: the *head*, the *trunk*, and the *extremities;* some, however, in consequence of the peculiar manner in which it is curved upon itself when within the uterine cavity, object to this division, and prefer another, comprising, 1, the *cephalic extremity*, or *head;* 2, the *pelvic extremity*, including the pelvis and the inferior extremities; and 3, the *torso*, or trunk, having reference to the parts between the head and upper pelvis. But the first arrangement is sufficient for all practical purposes.

The head is of an oval shape, and is the largest and least reducible part of the fetus, and a familiarity with its obstetric divisions and dimensions is highly necessary for the successful accoucheur. The bones of the fetal cranium are the same in number as in [illegible] head, but they are soft, and are not united by [illegible] their imperfect ossification gives rise [illegible] of greater or less extent, called word *suo*, to sew, and which are often of much benefit to the safety of the child during its passage through the pelvic canal, inasmuch as in every delivery they admit a certain degree of compression or reduction of the head, and even a riding of the bones over each other. They also serve as indications by means of which, the position of the head in the pelvis may be correctly ascertained. 'There are several of these sutures, but those which are the most important, are three in number—the others are of no practical utility in an obstetrical point of view:

1st. The *sagittal* or *median* suture or commissure, is situated between the two frontal and the two parietal bones, and extends from the root of the nose to the superior angle of the occipital bone, dividing the anterior and superior portion of the cranium into two equal parts; anteriorly, it is crossed at right angles by the coronal suture, and terminates posteriorly at the lambdoidal suture. Occasionally, but very rarely, instances are found where this suture extends throughout the occipital bone, dividing it into two parts.

2d. The *coronal* suture, sometimes called the *transverse*, *anterior*, or *fronto-parietal*, crosses the sagittal suture at right angles, separating the frontal from the parietal bones, and extends from the extremity of the greater wing of the sphenoid bone of one side, to that of the opposite side.

3d. The *lambdoidal*, or *occipito-parietal* suture, separates the upper edge of the occipital bone from the posterior edges of the parietal bones; in shape it resembles the Greek capital, *lambda*.

At the points of intersection and junction of these commissures are membranous spaces or openings, occasioned by the incompleteness of the ossification of the angles of the bones. There are six of these spaces in the fetal head, of which a knowledge of but two is all that is required for practical purposes; they are technically termed *fontanelles*, from *fons*, a fountain; they have also been called *bregmas*, from a Greek word signifying "to sprinkle," each name originating from an ancient idea that a moisture passed from the brain through these membranous spaces.

The *anterior fontanelle*, also called the *bregmatic*, or *frontal*, is the opening situated at the intersection of the coronal and sagittal commissures; it is of a quadrangular or diamond-shape, and may be distinguished by the four bony angles, the edges of which are soft and smooth, being almost always tipped with cartilage. The opening is of considerable size, which, however, varies in different heads, and the finger can readily detect it by its soft, smooth, and yielding character.

The *posterior*, or *occipital fontanelle*, is situated at the center or angle of the lambdoidal commissure at its point of junction with the posterior extremity of the sagittal commissure. In the immature fetus it may be felt distinctly, but in the full-developed infant it consists of merely a kind of triangle formed by the meeting of the two commissures, and is frequently wanting. This fontanelle may be distinguished by its triangular shape; its narrowness, being much smaller than the anterior fontanelle; having but three bony angles; and in consequence of the more complete ossification of the edges of the bones, they impart to the finger, on pressure, a hard, serrated sensation, which is never possessed by the edges of the anterior fontanelle, and which, therefore, will enable the practitioner to distinguish the one fontanelle from the other. In many instances, the posterior fontanelle is so small that it can only be distinguished by the three commissure lines that radiate from a common center.

It has been previously remarked, that occasionally the sagittal commissure continues throughout the occipital bone, dividing it into two parts, and in instances where this occurs, four bony angles will be perceived by the finger. The practitioner. however, can not err in this, if he will recollect that the posterior fontanelle is always smaller, and its edges rougher and harder than the anterior, and that on the slightest compression of the head, the occipital bone always glides under the ossa parietalia. The anterior fontanelle is invariably larger than the posterior, no matter how well marked this last may be.

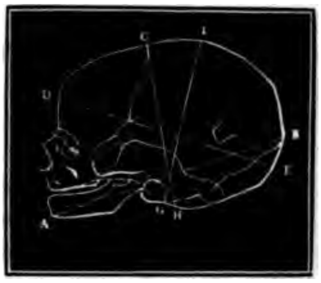
A thorough knowledge of the sutures and fontanelles is absolutely required in the practice of midwifery—for it is from them that the position of the head within the pelvis is ascertained with certainty; and in cases where interference is demanded, from a too early departure of the head from its proper or flexed position, or from some other cause, the educated accoucheur can at once render the necessary assistance to bring the labor to a safe and prosperous termination. But if he have neglected to inform himself on these points, his patient may be subjected to much unnecessary suffering, and, perhaps, from lack of timely aid, the death of both mother and child may ultimately ensue. Hence, a perfect acquaintance with these peculiar marks can not be too strongly impressed on the mind of the student. It is from these alone, that the situation of the head when in the pelvis can be correctly ascertained, and never by an ear, nose, or other part of the head.

There are four principal DIAMETERS belonging to the fetal head, viz:—

1. The *large, oblique*, or *occipito-mental* diameter (A B, *Fig.* 16), extending from the vertex or posterior fontanelle to the symphysis of the chin;

its measurement is from five to five and a half inches. It is important to recollect this diameter, for if it enters the cavity with either extremity descending, it can not be reversed, from want of space, but must either be allowed to escape as it presents, or be returned above the superior strait to effect a change. This diameter may be safely elongated by compression of the cranium with the forceps or otherwise, to the extent of six or ten lines, so that its whole measurement may be six or seven inches.

FIG. 16.



DIAMETERS OF THE FETAL HEAD.
A B. Occipito-mental.
D E. Occipito-frontal.
C H. Cervico-bregmatic.
I G. Trachelo-bregmatic, or vertical.
A D. Fronto-mental, or facial.

2. The *longitudinal*, *horizontal*, *antero-posterior* or *occipito-frontal* diameter (D E, *Fig.* 16), extends from the center of the forehead to the occipital protuberance; its measurement is from four, to four and three-quarter inches.

3. The *perpendicular*, *vertical*, *occipito-bregmatic* or *trachelo-bregmatic* diameter (G I, *Fig.* 16), extends perpendicularly from the most elevated point of the vertex, or top of the head to the anterior portion of the great occipital foramen; its measurement is from three and a half, to three and three-quarter inches.

4. The *small*, *transverse*, or *bi-parietal* diameter (A B, *Fig.* 17), extends from the center of one parietal protuberance to that of the other; its measurement is from three and a half to nearly four inches. This diameter may, by compression of the cranium with the forceps or otherwise, be diminished one-third or even three-fourths of an inch, without any injury to the child.

In addition to these measurements of the fetal head, with which the student must become familiar, authors have given several others, a knowledge of which, however, is not necessarily important in practice, they are:

1. The *cervico-bregmatic* diameter (C H, *Fig.* 16), which extends from the back part of the neck to the center of the anterior fontanelle; it measures from three and a half to three and three-quarter inches.

2. The *fronto-mental*, or *facial* diameter (A D, *Fig.* 16), extends from the symphysis of the chin, to the center of the forehead; it measures from three to four inches.

3. The *post trachelo-frontal* diameter, which extends from a point midway between the occipital protuberance and the occipital foramen, to

the center of the frontal bone; it measures from four to four and three-quarter inches.

4. The *præ-trachelo occipital* diameter, extends from the hyoid bone to the posterior fontanelle; it measures from three and a half to four inches.

5. The *bi-temporal* diameter (C D, *Fig.* 17), extends from the root of the zygomatic process on one side to the same point opposite; it measures from two and three-quarter to three inches.

6. The *sub-occipito-bregmatic* diameter, extends from a point midway between the foramen magnum and the occipital protuberance to the anterior fontanelle; it measures three and three-quarter inches.

In order that the diameters of the fetal head may, at one glance, be compared with those of the pelvis, I present the following tables after the manner of Cazeaux:

Diameters of the Pelvis. (In Inches.)	Antero-posterior	Transverse.	Oblique.	Sacro-cotyloid.
Superior Strait,	4 to 4½	5 to 5¼	4½ to 5	3¾ to 4⅛
Inferior Strait,	4 to 5	4 to 4¼	4 to 4½	....
Excavation,	4½ to 5⅛	4½ to 4¾	4¾	....

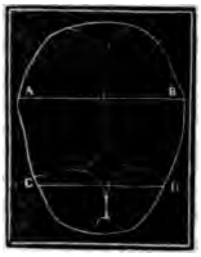
DIAMETERS OF THE FETAL HEAD.

Longitudinal Diameters,	Occipito-mental,	5 to 5½	inches.
	Occipito-frontal,	4 to 4¾	“
	Sub-occipito- bregmatic,	3¾	“
Transverse diameters,	Bi-parietal,	3½ to 3¾	“
	Bi-temporal,	3	“
Vertical diameters,	Trachelo-bregmatic,	3½ to 3¾	“
	Fronto-mental	3 to 4	“

A comparison of the diameters of the fetus with those of the pelvis, will be found of much utility, enabling the practitioner more readily to effect a correspondence between the large diameters of the head, and the long diameters or axes of the pelvis, in all cases where such a change may be required. From an investigation of these measurements, it will be seen that at full term, the fetus, to be safely and readily expelled must present one end of its long diameter (A or B, *Fig.* 16); and also, that if its occipito-mental diameter is parallel with the plane of the inferior strait, delivery will be impossible; either the chin or the occiput must descend first. It will likewise be observed, that the most favorable position for the expulsion of the fetal head, is to have it strongly flexed upon the body, so that its largest diameter, the occipito-mental, shall correspond to the long diameters or axes respectively of the straits and cavity, while its sub-occipito-bregmatic diameter, shall be parallel to the plane of the straits, and the occiput shall, during its passage, correspond to one extremity of an oblique diameter, until the rotation ensues which places the presenting extremity under the arch of the pubis.

Each of the diameters of the fetal head have a circumference assigned to them, the largest of which is the occipito-mental circumference, and which with the occipito frontal or horizontal circumference, are more important than the others, because, during labor, they successively come into relation with the pelvic parietes. The fronto-mental circumference, passes over the chin, cheeks and forehead, and is consequently termed by several writers, the facial circumference. The remaining circumferences are unimportant.

Fig. 17.



Diameters of the Fetal Head.
A B. Bi-Parietal.
C D. Bi-temporal.

The other diameters of the fetus are:

1. The *bis-acromial* diameter, extending from one acromial process to the other; it measures four and a half inches.
2. The *dorso-sternal* diameter, extending from the vertebral column through to the sternum; it measures three and a half inches.
3. The *bis-iliac* diameter, extending from the crest of one ilium to that of the other; it measures three and three-quarter inches.
4. The *bi-trochanteric* diameter, extending from one trochanter to the other; it measures three and a half inches.

The movements which the fetal head is enabled to execute with safety, in consequence of the laxity of the articular ligaments between the head and vertebral column, must not be forgotten. In head presentations, the shoulders are usually expelled so soon after the head has passed, that accidents are rarely met with; but in breech or feet presentations, or in cases of turning, in which the head may be retained for some time within the cavity from mal-position or otherwise, the careless or unskilled accoucheur may, by the employment of an ill directed force, occasion the death of the child.

The head may be moved in four different directions, termed *flexion*, *extension*, *lateral inclination* and *rotation;* and the extent to which these movements may be carried, must never be lost sight of.

The *movement of flexion*, is that in which the head is thrown forward and downward, so that the chin is depressed upon the neck or upper part of the sternum, and to which extent this motion is limited. By it, the occipito-mental diameter of the head is made part of the long diameter of the fetal ovoid or ellipse. This movement of the head should never be forgotten, as when it is incomplete, or there is too early a departure of the chin from the breast, during the passage of the head through the pelvic canal, an attention to it, with the proper manipulation to restore the flexion, as hereafter described, will very much facilitate the expulsive progress of the head; but a want of care or knowledge in this matter may, in these instances, render the labor tedious, painful and even hazardous.

The *movement of extension*, is the reverse of the former; the head is thrown backward; and the motion is limited by the occiput coming in contact with the back of the neck. This motion takes place in occipito-anterior positions of the head, in which the vertex becomes placed under the pubic arch, while the forehead, face and chin, leaving their previous state of flexion, pass successively along the arch of the sacrum, coccyx and perineum.

The *movement of lateral inclination* is that in which the head is thrown to one side or the other, and is limited by the side of the head, meeting with the corresponding shoulder.

The *movement of rotation*, is that in which the face of the child is turned from one side to the other. All the other motions are limited in their extent by an opposing obstacle, but in this last there is none presented, and if it be carried too far, the life of the child will be endangered. I have met with several cases of still-born infants, occasioned by the midwife rotating the body of the child beyond its proper limits; and instances are recorded where the body has been made to turn once and even twice, almost, if not actually twisting off the neck. It must be borne in mind that the head cannot be rotated upon the neck, with safety, beyond one quarter of a circle, or in other words, the face of the child can not be turned to the right or left beyond the corresponding shoulder; and this applies to the head when out of the pelvis, and the body within, and likewise to the body out of the pelvis and the head detained.

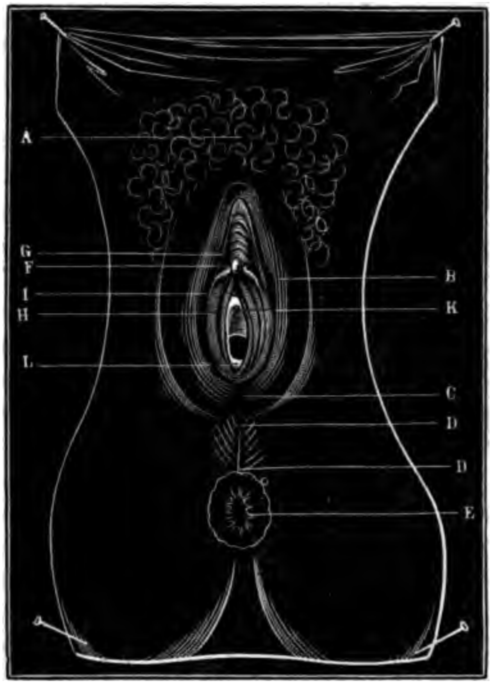
One thing may be adverted to here which will be again noticed in another place, and which is, that pulling the body of the child for the purpose of extracting the head, or pulling with the forceps applied to the head, the body not being expelled, are not only improper but exceedingly culpable. I have known a practitioner, in his endeavor [redacted] extract the head with the forceps, pull so forcibly and continuously to almost tear the head from the body, at the same time lacerating soft parts of the mother in a most shocking manner.

CHAPTER VII.

THE FEMALE ORGANS OF GENERATION.

Having referred to the osseous portions of the female and of the fetus, in their obstetrical relations, it becomes necessary to briefly notice the soft parts which cover them, constituting in the adult female, the organs of generation, and which are divided into *external* and *internal*. The external organs to which the term *Pudendum* is applied, are situated on the exterior of the pelvis, where they may be noticed by the eye, and comprise, 1st. The *mons veneris;* 2d. The *vulva and its parts;* 3d. The *perineum.* The internal organs are more deeply seated, and can not be seen or studied except by dissection, they are, 1st. The *vagina;* 2d. The *uterus;* 3d. The *fallopian tubes and ligaments;* and 4th. The *ovaries,*

Fig. 13.



The External Female Organs of Generation.

A. The Mons Veneris.
B. The Labia Externa, or Labia Pudendi.
C. The Fourchette, or Posterior Commissure of the Vulva.
D D. The Perineum, extending from the Posterior Commissure of the Vulva to the Anus.
E. The Anus.
F. The Clitoris.
G. The Preputium Clitoridis.
H. The Nymphæ, or Labia Interna.
I. The Vestibulum.
K. The Meatus Urinarius.
L. The Hymen.

The MONS VENERIS, or *supra-pubal eminence,* is a triangular space situated at the lower part of the hypogastrium, immediately on the fore part of the pubis, in front of, and just above the symphysis pubis. It presents a prominent rotundity, which varies according to the quantity of adipose matter deposited, and of which it is principally composed; it is more prominent in young and vigorous virgins than in mothers and aged females, and is said to be much more so in young females the natives of tropical climates. The cutis or skin which covers this part is smooth in early life, but becomes covered with hair or capilli at maturity, and is supplied with numerous sebaceous follicles. Through the adipose cellular tissue, are ramifications of some branches of the external pudic vessels and nerves, and in it are distributed some fibers of the round ligaments of the uterus.

The uses of the mons veneris during copulation are not satisfactorily ascertained, though it is said to be more elevated when the female is laboring under sexual excitement, and immediately previous to menstruation. Moreau states, that in parturition, owing to the extensibility of the skin, and laxity of the cellular tissue contained within it, it assists in augmenting the size of the vulva. This part is sometimes attacked with inflammations and abscesses which prove exceedingly painful, and may suffer from the various forms of disease common to the tissues entering into its formation.

The VULVA is the slit, or longitudinal fissure (*fissura vulvæ*, or *genital fissure*), which extends from the mons veneris superiorly, along the median line, to the perineum inferiorly. The orifice of the vulva serves as an entrance to some of the internal organs; it varies in extent in different persons; is very small in infancy, small and narrow in girls, of greater width and extent in women, and during parturition distends to a size which admits of the free passage of the child through it. After copulation its size is usually double that of the vaginal orifice; and in women who have borne many children, or who have had laceration of the perineum, it most commonly remains quite large.

Along the lateral portions of the vulva, are two rounded folds, or oblong eminences, or lips, which extend in a longitudinal direction from the mons veneris to the posterior part of the vulva; these are called the LABIA MAJORA, *labia externa*, or *labia pudendi*. As they proceed from before backward, they diminish in thickness, which renders them more prominent above than below; their superior extremity is adherent, the inferior being free and rounded. Externally, the labia majora are covered with the common skin, on which a few hairs may be found, and which is supplied with numerous sebaceous follicles; internally, it [illegible] covered with a beautifully fine, smooth, and sensitive mucous [illegible] of a florid color in young persons, but which is lost on age. The inner, or mucous surface is supplied with gla a fluid preventing an adhesion of these parts, as well them from the effects of friction. By their approxim majora cover and protect the internal parts from the air and external agencies; and during parturition, when the child is about to be expelled, by their elongation and almost entire disappearance, they increase the capaciousness of the vulva. They may be attacked with inflammation, abscess, hernia, serous infiltration, or other diseases, which sometimes interfere with their functional activity, or occasion various accidents.

The point of union of the labia majora, at their upper, or anterior extremity, at the symphysis pubis, forms the *anterior commissure* of the vulva; and at their lower, or posterior extremity, they form a kind of bridle at the anterior edge of the perineum, called the FOURCHETTE, *frænum*, or *posterior commissure* of the vulva, which is often slightly lacerated during first labors, but which occurrence causes no trouble. The posterior commissure is the most dense and resisting point of the vulva, not yielding without difficulty.

On separating the labia majora, we observe several other parts; the NYMPHÆ, *labia interna*, or *labia minora*, which are two membranous folds, located between, and running parallel with, the labia majora, and which extend from the anterior commissure to about the center of the genital fissure: they are formed of cellular, as well as spongy, erectile tissue, covered with mucous membrane, and contain vessels and nerves which render them highly sensitive. Their superior edge is coherent, the inferior, loose; and a little below the anterior commissure of the vulva, they unite, the anterior extremity passing around the clitoris, so as to form a hood, or prepuce to it, while the posterior is lost in the corresponding labium pudendi. In young persons their color is lively red, they are firm, and their surface is not corrugated, but smooth; in women who have had children they become darker and wrinkled. Females of a phlegmatic temperament, and especially those laboring under leucorrhea, have them pale and flaccid; and in brunettes they are dark, granulated, and sometimes quite long. They are furnished with a sebaceous substance, which, if allowed to accumulate in quantity, occasions a disagreeable fetor.

In early life the nymphæ are so long as to project beyond the external lips, or labia majora, which, however usually disappears at puberty. Occasionally the labia minora have projected so far as to produce much inconvenience, requiring an operation for their removal; and among the South Africans, especially the Bochisman women, this elongation is found in an excessive degree, extending to eight or ten inches below the margin of the labia, forming what has been named the *apron* of the Hottentots.

The uses of the nymphæ are unknown, although [illegible] sed to add to the voluptuousness of copulation, and to amplify the vulva during parturition, by becoming distended or effaced; this last view, however, does not agree with my own observations, as I have repeatedly ascertained their presence during the passage of the fetal head into the world.

The CLITORIS is situated at the superior and median part of the vulva, at the junction or origin of the labia minora, and below the anterior commissure of the vulva. It is a small red projection, bearing some resemblance to the male penis, having two corpora cavernosa, which are attached to the crura of the pubes, a spongy, cellular tissue, somewhat similar to the corpus spongiosum in the male, two erector muscles, rendering it erectile, and is surrounded with a fold of the internal mucous membrane of the labia, which forms the prepuce, or *preputium clitoridis*. It is, however, imperforate, being without a canal, or urethra. At its external termination is a round, red protuberance, which from its shape has received the name of *glans clitoridis*.

The clitoris is supplied with arteries and veins from several sources, and its nerves, which arise from the sacri, endow it with intense erotic sensibility. Its length is variable, and when uncommonly long or hypertrophied, has sometimes occasioned doubts as to the sex of the individual. It is of no service in parturition, but is considered as the principal seat of venereal pleasure in the female; the excision of this organ in the adult female very much lessens the voluptuousness of sexual congress; and its titillation alone, will give completion to the venereal orgasm, as in instances of masturbation. In infants, this organ presents an apparent excess of size, projecting beyond the vulva, and which is owing to the want of development of the proximate organs, especially of the labia majora.

The VESTIBULUM is a triangular space or depression, about an inch in length, having the clitoris above, the meatus urinarius or orifice of the urethra below, and the nymphæ laterally. The lower or inferior portion of this depression is divided by a line or raphe, which can be readily felt with the point of the finger, and which leads directly to the orifice of the urethra. It is supplied with numerous mucous glands. Immediately beneath the vestibulum may be recognized, situat [illegible] line with the top of the pubic arch, a small bulbous projection [illegible] ion, which incloses the orifice of the urethra. A knowledge [illegible] arrangement will render the catheterism of the female an e ration.

The FEMALE URETHRA is a slightly curved canal, fr two inches in length. It is larger and more dilatable than t male, and passes directly beneath and behind the symphysis pubis in an oblique direction, upward and backward, having its concavity upward, on the pubic side, and its convexity downward, on the vaginal side. During labor or parturition, the urethra becomes elongated, and its direction, as well as that of its orifice, changes, so as to create difficulty in the introduction of the catheter. For instance, distension of the bladder with urine, distension of the vagina by the presenting parts, or the elevation of the uterus, may carry the urethral canal high upward, and sometimes thrust it against the pubes, so that its orifice will be brought behind the symphysis pubis; in such cases, the sound or catheter must be introduced behind and parallel to the symphysis. The urethra is lined internally with mucous membrane, the folds of which usually run longitudinally and not transverse.

The *external orifice of the urethra*, called the *meatus urinarius*, is situated below the vestibulum, and immediately above the vaginal opening; it is irregularly round, and is more constricted than the upper portion of the urethral canal. A membranous swelling or cushion abundantly supplied with numerous follicles, surrounds it; and in ordinary cases, where the introduction of the catheter is necessary, after having found this raised cushion, which, as already stated, is at the lower part of the vestibulum, directly under the symphysis pubis, the orifice will be discovered in the center of it. The point of the catheter should be directed perpendicularly to the surface of the vestibulum, introduced within the orifice, then by depressing the handle, the point will turn upward behind the pubis and toward the bladder. This tubercle or caruncle of the urethra varies in its development, the orifice being sometimes very thin, merely membranous, and at others very patulous and funnel-shaped.

In instances where from long-continued pressure of the child's head, or from other causes, the practitioner is unable to detect the meatus urinarius, and it is absolutely necessary that the bladder should be evacuated to avoid its rupturing, or the probable formation of a fistulous passage between it and the vagina, it may be necessary for the practitioner to expose the parts to sight, in order to introduce the catheter, indeed it is his duty to do so; but under ordinary circumstances the patient should never be exposed for the operation.

The urethra may be so severely pressed by the fetal head as to occasion sloughing, resulting in urethro-vaginal fistula, which is a very difficult malady to remove; and in operations with the forceps or crotchet, the practitioner should be extremely cautious not to bruise or lacerate this canal, as it is almost certain to result in pe [illegible] lisidium of urine. The urethral mucous membrane is subject to prolapsus, tumefaction, and occasionally polypus growths.

The HYMEN, also termed the *virginal valve*, *vaginal valve*, *flos virginitatis*, *claustrum virginale*, etc., is a membranous fold formed by the mucous membrane of the genital surface. It is situated about half an inch within the vulva, at the orifice of the vagina, which it closes more or less perfectly, and is usually in the shape of a crescent, with its convexity downward and adhering, and its concavity upward and detached. Sometimes it is oval from right to left, or circular, with one or more openings which allow the various secretions and discharges from the vagina and uterus to pass out; occasionally it is imperforate, preventing the egress of these discharges. Ordinarily, the hymen is quite thin and delicate, being ruptured by the slightest causes; sometimes it is soft and lax, yielding without rupturing; and instances have occurred in which it was so firm as to present an obstacle to copulation, or to embarass the process of parturition, to remedy which, it has been found necessary to make a circular incision in it.

The uses of this membrane are not well defined, nor can they be of much consequence, since it is lost daily without injury. The presence of the hymen has long been regarded as a sign of virginity, but when we reflect that it is sometimes readily ruptured in females of undoubted chastity, even in the acts of laughing, coughing, sneezing, lifting, etc., and again that it has been found entire at the time of parturition, most convincing proof is afforded, that, as an emblem of virginity, this membrane can not be depended upon under any circumstances whatever; for its absence affords no evidence that sexual intercourse has taken place, nor does its presence prove the condition of chastity. It is often destroyed, during infancy, by careless nurses who rub these parts roughly with a coarse towel. I have met with three instances only, of firm and imperforate hymen in which it was impossible for the nuptial rites to be consummated, and one in which it was present at the parturient period, and in each of which the difficulty was removed by the bistoury.

Along the circumference of the orifice of the vagina, are several small, flat, or rounded reddish tubercles, commonly numbering from two to four, occasionally five or six. Sometimes they are pale, or livid, and vary in firmness. They exist in pairs, the two posterior being generally larger and longer than the anterior. These are termed the CARUNCULÆ MYRTIFORMES, and are considered by some anatomists as the remains of the ruptured hymen, while others view them as existing independent of this membrane. I have, in three instances, witnessed the unruptured hymen simultaneously with the presence of the carunculæ. As they disappear during the expulsion of the fetus, they may probably be designed for enlarging the capacity of the vulva, thereby diminishing the risk of severe contusion or laceration. When they become so large as to cause unpleasant symptoms they may be removed by the scissors.

Between the posterior commissure of the vulva, or fourchette, and the hymen and the external orifice of the vagina, is a space or depression bearing some resemblance to the cavity of a small boat, which is called the FOSSA NAVICULARIS, or *concha*. Its greatest extent is six lines, or half an inch. It is found in girls and in women who have not given birth to children, but is usually ruptured in a first confinement by the efforts made to expel the fetal head, and which is followed by no serious consequences unless more or less of the perineum be likewise involved. It is the most inferior part of the vulva, and hence becomes a receptacle for vaginal and uterine discharges; and inflammation and syphilitic ulcerations are frequently located there, among public women, which occasion obstinate and incurable difficulties.

The PERINEUM proper, includes the whole of the space between the coccyx and the pubes, including the terminal orifices of the urinary, generative, and digestive apparatus; but in Obstetrics, by the term *perineum*, is meant the space lying between the posterior commissure of the vulva and the anus. It is from an inch to an inch and a half in length, and presents on its external surface, on the mesial line, a prominent, hard ridge, which is termed the *raphe of the perineum*. Externally the perineum is covered with the skin; internally, it consists of adipose cellular tissue, of fascia, and of several muscles. In some females it is thick, hard, and resisting; in others it is thin, soft, and easily dilated; conditions which render labor tedious or otherwise, by retarding the passage of the fetal head when rigid and unyielding, or allowing it to pass by a ready dilatation.

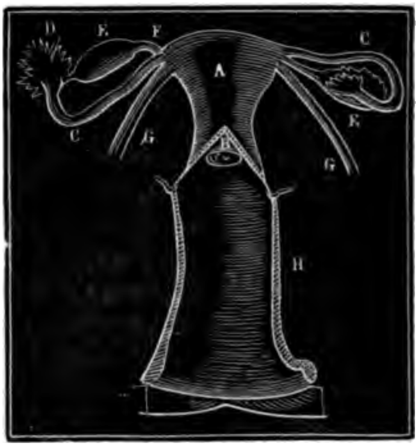
In the last stage of labor, the perineum usually offers more or less resistance, but eventually becomes thinner, elongates, and extends even to four or five inches, thus affording a passage for the child; and it is at this period, when the head is passing, that it becomes occasionally lacerated, or more rarely, perforated through its center. This accident, however, may generally be avoided, by supporting the perineum with the hand, making such firm but moderate pressure as will prevent the head from advancing too rapidly, and which, at the same time, will allow the tissues an opportunity to acquire the proper degree of extensibility. Excessive and injudicious support will undoubtedly effect more mischief than benefit. The condition of the perineum should never be overlooked by the practitioner, as it frequently presents an obstacle to delivery far greater than the os uteri, the straits, and the vagina together, owing to its unyielding resistance; and a labor which, under ordinary circumstances, would be finished in from fifteen to thirty minutes after the head has reached this point, may be continued for several hours. This rigid condition of the perineum is often brought on by excessive meddling, frequent examinations, etc. I have overcome several instances of obstinate resistance, in a very short time, by the application to the perineum of a warm poultice composed of Hops, Lobelia leaves, Water and soft Soap; other applications of a similar nature may answer, but they must only be employed in those cases where the perineum does not appear to yield in the least degree (*Fig.* 18).

CHAPTER VIII.

THE INTERNAL ORGANS OF GENERATION.

THE internal organs of generation, belonging to the female, are, as previously remarked, the vagina, the uterus and its appendages, the Fallopian tubes, ligaments, and ovaries (*Fig.* 19).

FIG. 19.



THE INTERNAL FEMALE GENITAL ORGANS.

A. The Uterus, seen on its Anterior Face.
B. The Intra-vaginal portion of the Neck of the Uterus.
C C. The Fallopian Tubes.
D. The fimbriated Extremities of the Fallopian Tubes.
E E. The Ovaries.
F. The Ligament of the Ovary.
G G. The round Ligaments
H. The Vagina laid open.
On the right the fimbriated extremity of the Fallopian Tube is seen applied to the Ovary.

The VAGINA, is a cylindrical membranous canal, which connects the internal with the external organs of generation; it is located in the pelvic cavity, being posterior to the bladder and urethra, and anterior to the rectum. Its direction is nearly coincident with the axis of the pelvis, which gives a curved form to it, the concavity of which, is on its anterior or pubic surface, and the convexity on its posterior or rectal surface. The walls of the vagina are soft and yielding, and slightly flattened from before backward—the anterior wall being shorter than the posterior. In well formed women, its length is five or six inches, and its width one, but this usually varies according to age, and the different circumstances of life. In girls, it is longer and narrower than in married women, and especially those who have borne children; and in African women it is longer and wider than in European. The middle portion of the vaginal tube is larger than at the extremities, and the lower or inferior orifice is more contracted than at its upper or superior extremity. As females advance in years, the vagina gradually contracts its dimensions to nearly those found in young girls. It is composed of a fibrous and mucous membrane; the first is placed externally, and consists of condensed cellular tissue, highly elastic, and of a reddish color.

The *external surface of the vagina* is united, in front, to the bas-fond of the bladder and to the urethra, by cellular tissue, which becomes denser as it approaches the vulva; behind, to the rectum, by similar cellular tissue, but which is less dense than in front; laterally, to the broad ligaments and ureters above, and below to the umbilical arteries, the sacral plexuses, the hypogastric vessels, the levator muscles of the anus, and the pelvic cellular tissue; and superiorly, above and behind, by a double fold of peritoneum.

The *internal surface of the vagina* is divided into an anterior and a posterior wall. In the center of each of these parietes is a longitudinal line or ridge, the one on the anterior being more distinct and prominent than that on the posterior wall; these ridges are called *columnæ vaginæ*, or columns of the vagina—one, the anterior column of the vagina, the other, the posterior column of the vagina. One or two tubercles are generally found at their inferior terminations. These columns are intersected at right angles by transverse parallel rugæ, folds or wrinkles, which become more prominent and approximate more closely as they advance toward the vulva; these rugæ, however, do not constantly exist, they are more distinctly marked in girls and in aged women; and during pregnancy, as well as for a short period after parturition, they are nearly effaced. Some writers consider them as aids to the enlargement of the vagina during labor; others, that they assist in the elongation which it undergoes during pregnancy, caused by the ascent of the uterus: and others again, that by multiplying the points of contact between them and the male organs, the voluptuousness of coition is increased.

The *superior, internal, or upper extremity of the vagina*, is attached around the upper part of the neck of the uterus, being a little higher behind than in front. The peculiar manner by which it embraces the neck, gives rise to a circular fissure or groove, to which the name cul-de-sac has been applied; the one in front, being termed *the anterior cul-de-sac;* that behind, and which is more distinctly marked, *the posterior cul-de-sac.* These culs-de-sac are of greater or less depth, according to the projection of the neck of the uterus. This portion of the vagina is in immediate contact with the peritoneum, which separates it from the abdominal cavity; and it is here where injuries are most commonly inflicted by the use of instruments, often resulting in inflammation and death; hence, when operations are demanded, great care should be observed by the operator.

The inferior, external or lower extremity of the vagina, sometimes termed the external or vulvar orifice, which terminates below the urethra, is narrowed at its entrance, and, in the virgin, is usually partially closed by the hymen.

The *internal parietes of the vagina* are composed of a mucous membrane which is the continuation of that of the vulva, and internal membrane of the uterus; inferiorly, this membrane is of a red or vermillion tinge, and superiorly it has a whitish or grayish appearance. Occasionally, it presents posteriorly, bluish or livid spots, which are more or less irregular. It is furnished with numerous mucous follicles, the secretions from which constantly keep the parts during health, and especially during parturition, in a state of lubricity. If this organ becomes dry and inflamed, while labor is progressing, a rigid and unyielding condition of it ensues, which must necessarily occasion much distress to the patient; hence the importance of examining during labor, as seldom as possible, because the frequent introduction of the finger into the vagina not only removes the moisture of the parts, but likewise irritates them; beside frequent touchings are useless, deleterious and immodest.

The part surrounding the orifice of the vagina, is termed *the bulb of the vagina* or the *plexus retiformis;* it is a dense, compact, erectile spongy tissue, somewhat resembling that of the corpus spongiosum urethræ, of a grayish or bluish color, about an inch in breadth, and two or three lines in thickness. During the venereal orgasm, it contracts the vaginal cavity, and thus increases its resistance. The *sphincter vaginæ* or *constrictor vaginæ* muscle is formed by some muscular fibers on the outside of this spongy tissue; it contracts the vaginal orifice, and depresses the clitoris.

The arteries of the vagina come from the internal iliac; its veins, which are numerous, form a kind of net-work called plexiform, and flow into the hypogastrics; its nerves arise from the sacral plexus, and its lymphatics are lost in the hypogastric lymphatic plexus. The contractility of the vagina is of the peculiar elastic character common to all cellular structure. As soon as the fetus has been expelled, this organ resumes its natural condition in a very short time, except in cases where the head has been confined in the cavity for a longer period than usual, when its contraction will not take place for one or two hours; and the hand may be very readily introduced within it for some hours after delivery.

The vagina serves as a medium through which external bodies may pass toward the uterus, as during copulation, and also through which the uterine contents and vaginal secretions may pass off, as the fetus, menses, etc. It is subject to inflammation, ulceration, eversion, inversion, etc., the history and treatment of which, more properly belong to a treatise on "Diseases of Women."

The UTERUS, or *womb* is a hollow organ, whose principal functions are to receive the impregnated ovum, as it escapes from the Fallopian tube, to assist in its nourishment, growth, and preservation, until the parturient period arrives, and then to act as the principal agent in forwarding its expulsion. It is a *gestative*, not a *generative* organ.

In shape, the uterus is conical or pyriform, usually described as resembling a pear flattened from before backward, with its base turned upward, and its apex downward. It is situated obliquely in the pelvic cavity, below the small intestines, between the bladder and rectum, and above the vagina; and is retained in its position by the round and broad ligaments, and the vagina. Its axis or long diameter very nearly corresponds with the axis of the superior strait. In very young females its base is below the superior strait; in adults it is nearly on a level with it.

In childhood it is quite small, but rapidly increases in growth toward puberty and adult age, and after the period of child-bearing, it diminishes to nearly its infantile size. Its average length, in the adult woman, is three inches; its breadth at the fundus, two inches, and toward the neck, including the os tincæ, one inch to one and a half inches; and its thickness from eight to twelve lines, or from four to six lines for each of its walls.

Immediately previous to menstruation and during that term, it usually becomes greatly augmented in volume, which may be mistaken for the commencement of a pregnancy. Its weight, in the virgin female, is seven or eight drachms, and in those who have had children, from twelve drachms to an ounce and a half, while in the aged female it dwindles to one or two drachms.

The uterus is divided into three parts: 1, the *base* or *fundus uteri*, which is only a few lines high, being confined to all that portion which rises above the insertion of the Fallopian tubes; 2, the *body* or *corpus uteri*, which is the largest division of the uterus, and includes all that part of the organ situated between the fundus and the neck, or contracted portion; 3, the *neck* or *cervix uteri*, which is the contracted and elongated portion found below the body, and which is embraced by the vagina, forming in its cavity a projection of four to six lines, at the extremity of which is an opening, termed *os tincæ*, from its fancied resemblance to the mouth of the tench fish.

Generally, the uterus is slightly inclined to the right, sometimes to the left, or backward. Its position, however, is not constant, being determined by its own condition, as well as that of the neighboring parts. Thus females in whom the vagina is short, will have the axis of the uterus approximating that of the inferior strait; sometimes the fundus is thrown so far forward that the anterior wall is the most inferior part, constituting an *anteversion;* at other times it may be the reverse of this, the fundus being thrown in the hollow of the sacrum, and the neck behind the symphysis pubis, producing a *retroversion;* or, the fundus may be thrown to one side of the pelvic cavity, with the neck to the opposite side, which is termed *lateral version;* and again, the body of the uterus may be bent on the neck, either behind or in front, constituting an *anteflexion* or *retroflexion*.

We distinguish, in the uterus, an external and an internal surface. The EXTERNAL SURFACE is divided into an anterior and a posterior face, a superior and two lateral borders, two superior angles, and an apex.

The *anterior face* is smooth, polished, slightly convex, covered on its superior two-thirds by a prolongation of the peritoneum, and is in contact with the posterior face of the bladder, from which it is sometimes separated by some folds of the small intestine; inferiorly, it is united to the bas-fond of the bladder by loose cellular tissue, and which adhesion may account for the involvement of the bladder in many uterine displacements.

The *posterior face* is more convex than the anterior, and is covered throughout its whole extent by a prolongation of the peritoneum; it is likewise in contact with the anterior surface of the rectum, looking toward the concavity of the sacrum. The *superior border*, base or fundus, is convex, looking upward and forward, and is covered in its whole extent by a prolongation of the peritoneum, and by the convolutions of the small intestines. In the unimpregnated state it never reaches the level of the superior strait, and can not, therefore, be felt through the inferior abdominal wall, except by making considerable pressure. The *two lateral borders* are irregular, being convex in their superior half, and concave in their inferior; they are situated between the two duplicatures of the peritoneum, which constitute the broad and round ligaments, and which ligaments being attached to the anterior edge of the lateral borders, are consequently on the same plane as the anterior face of the uterus. The *two superior angles*, or *cornua uteri*, are formed at the junction of the superior with the two lateral borders, and from which point arise the Fallopian tubes and ovarian ligaments; the *apex* is the inferior extremity of the uterine neck, and is situated in the upper part of the vagina.

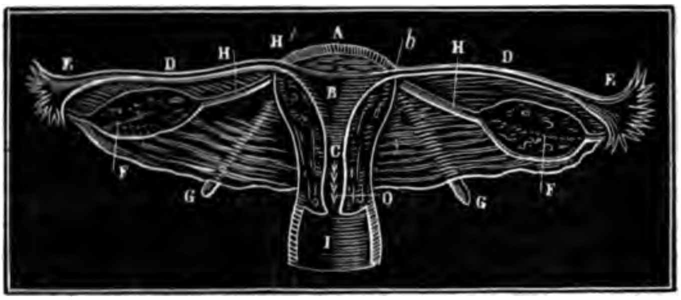
The CERVIX UTERI, or NECK OF THE UTERUS, should be thoroughly studied by the practitioner, with regard to its form, size, and consistence, in order to facilitate his diagnosticating the state of pregnancy, full term, etc., as well as the many abnormal conditions to which it is liable.

The neck of the uterus in the adult female who has never borne children, will be found to vary considerably from that of one who has; it is from twelve to fifteen lines in length, cylindrical, flattened from before backward, and fusiform, being about nine lines in its transverse diameter at the center, and from four to six lines at its extremities. It is embraced by the vagina toward its upper portion, leaving about two-thirds within the vagina, and one-third above the vaginal adhesion. The inferior or vaginal extremity of the neck, is of less volume than any other part of it, and is perforated in its center by a transverse fissure or orifice, of one or two lines in length, to which several names have been applied, as, *os tincæ*, *os uteri*, *os internum*, *mouth of the womb*, *uterine orifice*, etc. In the virgin, this orifice is completely closed up, and is sometimes difficult to find; the sensation conveyed to the finger in contact with it, is similar to that experienced by feeling the depression between the alæ nasi, at the end of the nose, with the pulp of the finger, and which sensation will assist us in recognizing the opening. The os tincæ divides the apex into two lips, an anterior and a posterior lip. These lips are smooth, regular, small, firm, thin, and closely approximated, the one anterior being slightly thicker and more prominent than the posterior. As the long diameter of the uterus is nearly parallel with the diameter of the superior strait, the face of the apex will be found looking toward the lower portion of the sacrum, in an inclined position; from which arrangement the anterior lip will be found a little lower down than the posterior.

In the woman who has borne children, the uterine neck varies in its extent, being reduced in length, according to the number of births, so much so, that instances are recorded in which the mothers of nineteen or twenty children, had the portion within the vagina, completely destroyed; the orifice is usually deformed, gaping, larger, and less regular, and sufficiently patulous to admit the introduction of the end of the finger; the lips are thicker and softer than in the virgin, and are filled with fissures or inequalities, which are more frequent on the left side of the neck, and are the results of lacerations of the fibers which occur during the passage of the child's head through the os uteri, and which have been prevented from uniting by the lochial discharges. These fissures are of variable depth, and sometimes are so numerous as to divide the lips into eight or ten small tubercles. These differences are of much importance in legal medicine; yet they may occasionally be produced by other causes than parturition, or may even be wanting in the mother.

The INTERNAL SURFACE of the uterus, presents a narrow, oblong, irregular cavity, with contiguous walls, which is divided into two parts, the *cavity of the body*, and the *cavity of the neck*. (*Fig.* 20.)

FIG. 20.



CAVITY OF THE UTERUS, AND THE FALLOPIAN TUBES.

A. Fundus of the Womb.
B. Cavity of the Womb.
C. Cavity of the Neck of the Womb.
D D. The Canal of the Fallopian Tubes laid open.
E E. The fimbriated Extremities.
F F. The Ovaries.
G G. The round Ligaments.
H H. The Ligaments of the Ovaries.
I. The Cavity of the Vagina.
b, H. The uterine Orifices of the Fallopian Tubes.

The *cavity of the body*, is triangular in shape, flattened, and when empty is not very extensive, being hardly large enough to contain a split almond. At each of its three angles, there is an orifice, the lower or inferior one leading to, and establishing a communication with, the cavity of the neck, and the two upper or superior ones forming the entrance into the Fallopian tubes; the openings in these latter are very narrow, and will scarcely admit a hog's bristle. Occasionally, this opening is divided by a perfect septum, which may render superfetation possible, and very rarely there exists a congenital deficiency of it. In the absence of the catamenial discharge, this cavity is constantly moistened by a sero-mucous fluid.

The *cavity of the neck* affords a communication between the cavity of the body and the vagina; it is oval and cylindrical, about twelve or fifteen lines in length, and five or six in its greatest breadth ; it is fusiform, flattened from before backward, presenting on its anterior and posterior wall several longitudinal and transverse rugæ or wrinkles, to which the term *arbor vitæ* has been applied ; they are formed by the lining membrane of the neck, and which are so arranged as to represent a fern leaf in relief ; they frequently disappear after delivery. On the mucous membrane of the neck are a number of muciparous follicles, more abundant about the os uteri, which were mistaken by Naboth for eggs, and hence have been called *ovula Nabothi*, *glandula Nabothi*, or the *glands of Naboth*. In the healthy uterus of the virgin, these follicles can hardly be seen, but during pregnancy, or when disease attacks the parts, they enlarge so as to be readily recognized by the eye, and when touched with the finger they feel like shot. During pregnancy, they secrete a thick, tough, pellucid, gelatinous mucus, in quantity sufficient to close up the cavity, and thus prevent any communication between the cavity of the body and the vagina. The internal surface of the neck is less vascular than in the body.

The character of the uterine tissue is very difficult to understand in its unimpregnated condition, but becomes more manifest during gestation. Its constituent parts are: an external peritoneum membrane, an internal or mucous membrane, a peculiar tissue, and numerous blood-vessels and nerves.

The *external peritoneal membrane* is furnished by the peritoneum, which, after having covered the posterior surface of the bladder, is reflected from behind forward, upon the anterior face of the uterus, covering its superior three-fourths, and extending over the fundus uteri and posterior surface of the uterus ; it is then prolonged on the vagina for a short distance, and from thence reflected upon the rectum. In front of, and behind the uterus, this membrane forms four small falciform folds ; those which are in the space between the bladder and uterus are named the *vesico-uterine*, or *anterior ligaments ;* and those situated between the rectum and uterus, being termed the *recto-uterine*, or *posterior ligaments*. On the borders of the uterus the attachments of the peritoneum are quite loose, but become more intimate toward the median line.

The existence of the *internal*, or *mucous membrane*, has been very much doubted by many anatomists, as may be seen from the following observations by Moreau:

"On examination, we find the inner surface of the body of the uterus to be soft, pulpy, having neither the brilliancy of the peritoneum, nor the whiteness of the mucous membrane of the vagina; of a reddish or blackish brown color; it generally contains, whatever may have been the circumstances preceding the death of the woman, a brown or dirty gray fluid. When the uterus is macerated, or boiled, or dissected soon after death, it is impossible to trace the mucous membrane beyond the cavity of the neck. If, on the other hand, we observe that all the hollow organs provided with mucous membranes, such as the stomach, intestines, bladder, and the vagina itself, and which are required, by their functions, to change in size, present, when empty, a rugose surface and folds more or less projecting, formed by the lining membrane; that this membrane is furnished, moreover, with numerous follicles, which pour out mucus intended to protect the organ from the irritation of the substances or bodies they may contain, or which may pass through them, we will see that no similar arrangement obtains in the cavity of the body of the uterus; the follicles are found only in the cavity of the neck; they are there disposed symmetrically, on four opposite lines, two on the anterior and two on the posterior paries. If the uterus were provided with a mucous membrane, could it bear the enormous enlargement resulting from pregnancy, without lacerations of its internal surface, such as frequently occur in the vagina at the time of delivery, and of which traces may be seen almost always in women who have borne children? Moreover, in advanced age, we often find obliteration of the cavity of the body of the uterus, as well as of the tubes. We have long observed this fact, which is confirmed by the researches of Mayer, reported by Breschet, and what is very remarkable, this obliteration, the natural consequence of age, does not extend beyond the internal orifice, at the point at which we have said the mucous membrane terminates. In organs lined by a true mucous membrane, the cavity always remains. In old cases of artificial anus, that part of the intestinal canal below the accidental opening, no longer giving issue to fecal matter, contracts, but never consolidates.

"We shall terminate these considerations by a single remark. The serous and mucous tissues, evidently communicate by means of the aperture of the Fallopian tubes. Is there a point at which these tissues change, and are transformed into each other? Undoubtedly there is; but where is it? Is the serous tissue suddenly arrested at the digitations of the tubes? Does it line the cavity of the fimbriated extremity? Does it extend along the tube as far as the uterus? or does the mucous tissue occupy the whole cavity? Is the latter prolonged, as it is said, into the cavity of the tube? Does it terminate at the fimbriated extremity, or extend beyond? This can not be demonstrated. If it be impossible to assign the precise point at which one of these tissues commences, and the other ends, is it not reasonable to regard the cavity of the body of the uterus, and of the Fallopian tubes, as respiratory surfaces; intermediate by their position, organization, and uses, to the serous and mucous tissues; upon them the transformation is exerted, but in a gradual, successive manner, without being able to determine accurately the point of mutation.

"This opinion acquires more value if we observe that the exhalations of the internal surface of the uterus are not identical over its whole extent. Haller had already found in the cavity of the body, a serous, whitish, muddy, and thin liquid, which, in the uterus of a newly born child, resembled milk, while that in the cavity of the neck was a thick, dense, and reddish mucus. The exhalations of the cavity of the body of the uterus, present under various circumstances, but normal for them, the characters of exhalation of the mucous and serous tissues, alternately morbid and physiological. Thus, in ordinary health, the matter exhaled by the uterine cavity, has a great analogy with mucus. When this surface is excited in a special manner by the act of generation, the fluid produced resembles more the serous exhalations; it is a concrescible, plastic lymph, which becomes condensed, and quickly changed into a species of false membrane, the *caduca*. When simply the seat of some fluxive function, as at the menstrual periods, a phenomenon is manifested which belongs equally to over-excited or highly inflamed mucous and serous tissues, a sanguine discharge is established, the affluxus is dispelled, and nature resumes her usual course.

"We may hence conclude, that the cavity of the body of the uterus possesses no mucous membrane; or if it exists, it has undergone such modifications as to leave no longer any resemblance to the same tissue in other parts."

Cazeaux, likewise, observes in relation to this membrane:—"To the reasons already offered by Morgagni, Chaussier, etc., in favor of its existence, we shall add those presented by Cruveilhier, which appear to us perfectly conclusive, viz: 1st. Every organic cavity communicating with the exterior is lined by a mucous membrane. 2d. Anatomy demonstrates that the vaginal mucous membrane is continued into the cavity of the neck, and then into that of the uterus, only it is deprived of its epithelium in penetrating the latter. 3d. When examined by a lens, the internal surface of the uterus exhibits a papillary disposition, but the papillæ are imperfectly developed. 4th. This internal surface has follicles or crypts spread over it, from which mucus can be squeezed out, and which, if their orifices be obstructed or obliterated, become distended by the liquid, and form little vesicles. 5th. It is continually lubricated by mucus. 6th, and lastly; the internal surface of the uterus, like all other mucous membranes, is subject to spontaneous hemorrhages, to catarrhal secretions, and to the mucous, fibrous, and vesicular vegetations, called *polypi;* and it is generally admitted that, wherever there is an identity of action, there is also an identity of nature."

That the inner membrane of the uterine walls is composed of a mucous body or tissue, has, according to the recent microscopic observations of M. Coste, and others, been decided in the affirmative, and which is probably continuous with the lining mucous membrane of the vagina, and of the Fallopian tubes.

The *peculiar tissue* of the uterus, which is under the serous membrane, and is named the *middle, fleshy,* or *muscular coat* of the uterus, is very dense in structure, resisting, of a dirty grayish color, being sometimes slightly pearly near the neck, crackles like cartilage under an incision with the scalpel, and constitutes the greater part, if not the fundamental structure of the organ. In the unimpregnated state of the uterus, it is very difficult to determine the true character of the uterine tissue, as it varies in color and density, its fibrous organization being concealed by the state of condensation of the organ. There has been considerable difference of opinion upon this point, some viewing it as belonging to the fibrous tissue, and others to the muscular; the condition of pregnancy, however, removes all doubt and uncertainty, and presents to us a true muscular tissue.

The *arteries* of the uterus come from the hypogastrics, or internal iliacs, under the name of uterine arteries, and from the aorta, or renal arteries, under the name of ovarian or spermatic arteries. The uterine arteries penetrate the uterus by its lateral borders, and describe a number of flexuosities in the proper tissue of the organ; the branches of the same side frequently anastomose with each other, and unite on the median line with those of the opposite side. They likewise communicate above and laterally with the branches of the ovarian arteries, and terminate in the interior tissue, continuing into the veins, and, probably, presenting orifices within the uterine ca

The *veins* follow the course of their respe
numerous, have no valves, and empty in

the right spermatic into the inferior cava, the left into the renal vein, and the uterine veins into the internal iliacs. The arrangement of the veins, in the uterine tissue, is analogous to that observed in the corpora cavernosa, and the erectile tissues; and their orifices on the internal surface of the uterus, are very large during pregnancy, and become visible just after delivery.

The *nerves* are derived, one portion from the sacral plexus of the cerebro-spinal system, which more especially supplies the cervix with nervous filaments, and, consequently, renders it more sensitive to the touch than any other part of the organ; the other portion, being destined to the organic life alone, is from the great sympathetic nerve, which supplies the body of the organ with filaments, and which will explain to us how most of the vital organs of the body, especially the brain and stomach, sympathize so readily with the uterus, both in disease and during pregnancy. The performance of the several functions of menstruation, conception, and parturition, is, without doubt, chiefly owing to the influence of the uterine nerves.

The *lymphatic vessels* are very numerous, and arise from different parts of the organ, forming reticulations, branches and trunks, which, united in bundles, leave the uterus in three different directions. The least numerous leave the abdomen by the inguinal canal, and are distributed to the inguinal ganglia; others, united to the lymphatics of the vagina, accompany the uterine and vaginal arteries, and terminate in the hypogastric lymphatic plexus. But the most numerous arise from the anterior and posterior surfaces of the neck and of the body, run toward the lateral borders, follow their direction, are then united with those of the ovaria, the tubes, and fundus uteri, ascend with the ovarian arteries and veins, in front of the psoas muscle, to join the ganglia situated in front of the aorta, the vena cava, and in the vicinity of the kidneys.

All the above vessels, etc., are very small during the condensed or unimpregnated condition of the uterus, but increase in size during pregnancy, and at full term acquire an enormous size, supplying the organ with torrents of blood. The lymphatic vessels, also, play a very important part in the diseases of the uterus.

Sometimes the uterus is absent entirely, at others but slightly developed, or it may be malformed, or in an abnormal position. It is liable to hernia, prolapsus, retroversion, anteversion, inversion, ulcerations, inflammations, etc., the history and treatment of each of which conditions will be described in my forthcoming work on "Diseases of Women."

CHAPTER IX.

OF THE UTERINE APPENDAGES—THE LIGAMENTS, THE FALLOPIAN TUBES, AND THE OVARIES.

The uterus is supported, in the pelvic cavity, by six duplicatures of peritoneum—two *anterior*, or *vesico-uterine*, and two *posterior*, or *recto-uterine* ligaments, to which reference has been heretofore made; also two *lateral*, or *broad ligaments*, which are much larger and more important than the others, as within them we find contained the *round ligaments*, the *Fallopian tubes*, and the *ovaries*. (*Fig.* 19.)

The BROAD LIGAMENTS are formed by two duplicatures of the peritoneum, which, covering the anterior and posterior faces of the uterus, are prolonged transversely, extending to the ilia; these two folds rest against each other, and divide the pelvis into two cavities, the anterior cavity containing the bladder, and the posterior the rectum. These ligaments are of a quadrilateral shape, and from their supposed resemblance to the wings of a bat extended, have been named, the *alæ vespertilionis*. Outwardly, and below, these ligaments are continuous with the peritoneum that lines the excavation; their upper, or superior border is loose, and extends from the angles of the uterus to the iliac fossæ, presenting three small folds, called *alæ*, or *wings*. The anterior wing is not distinctly developed, and is denied by some anatomists; it is occupied by the *round ligament*. The middle wing incloses the *Fallopian tube*, and the posterior contains the *ovary* and its ligament.

The space between the two serous folds constituting the broad ligament, is filled by a loose and very extensible lamellated cellular tissue, continuous with the *fascia propria* of the pelvis, and which is traversed by the uterine vessels and nerves. As gestation advances, and the uterus enlarges, the two laminæ of the peritoneum separate to receive the uterus, assisting to cover its anterior and posterior surfaces, and in consequence, during the latter month of pregnancy, the broad ligaments entirely disappear.

The ROUND LIGAMENTS, or *supra-pubic cords*, are two in number, one on each side; they are of cylindrical form, six or seven inches in length, of a fibrous appearance, and of a grayish white color. They arise from the lateral borders of the uterus, below and a little in advance of the Fallopian tube, and are directed upward and outward, following the outline of the pelvis; they are enveloped in cellular tissue, and are covered by a prolongation of the peritoneum, to which the name "Canal of Nuck," has been given. They enter the inguinal canal on each side, traverse it, emerge by the corresponding inguinal ring, and divide in front of and above the pubes into a number of fibrous fasciculi, which are lost in the cellular tissue of the groins, mons veneris, and labia pudendi. They contain a great number of veins, which are liable to become varicose.

There has been considerable controversy as to the structure of these ligaments, but the investigations of modern anatomists have ascertained them to be expansions or prolongations of the muscular fibers of the uterus, containing bloodvessels, nerves, lymphatics, and cellular tissue.

The real uses of the round ligaments are not satisfactorily known, they are supposed to be, to retain the uterus in its proper position, and to prevent its displacements. During pregnancy, chronic affections, or uterine displacements, these ligaments are subject to inflammation and engorgement, and which conditions may, probably, be the cause of the pains in the groins, frequently experienced by women thus circumstanced.

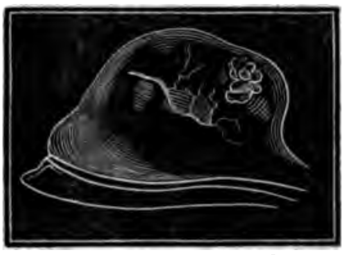
The FALLOPIAN, or UTERINE TUBES, are two cylindrical canals, from four to five inches in length, of a conical shape, flexuous and waving, and extend from the upper or superior angles of the uterus to the ovaries; they are placed in the thickness of the middle wing of the broad ligaments. The internal cavity of these tubes is very narrow at their uterine extremities, but, as they extend outwardly, it gradually increases in size, but again contracts just before opening at the fimbriated extremity. The internal extremities of the tubes are inserted into the superior angles of the uterus, where they open into the cavity of its body, their orifices being named the *internal* or *uterine*. The external or free extremities of the tubes, called the *fimbriated extremities* or *pavilion*, communicate with the peritoneal cavity by an oblong, inverted opening, with digitated or fringed edges, of which one is longer than the other, curved, and inserted into the external extremity of the ovary; the other hangs loosely over the ovarium. The openings at these ends of the tubes are named the *free orifices of the tubes*.

The tubes are enveloped by the peritoneum, which forms the outer or external tunic or membrane;—the internal membrane is a prolongation of the uterine mucous membrane (which, however, is denied by some authors), and is also continuous with the serous peritoneum; it is composed of two laminæ of fibers, the exterior of which have a longitudinal direction, while the internal are circular. Its vessels are derived from the ovarian, and its nerves from the great sympathetic. The middle layer or proper tissue of the tubes, is a continuation of, and identical in texture with, that of the uterus.

The Fallopian tubes serve to conduct the fecundating principle of the male to the ovaries, and to seize the impregnated germ or ovule of the female and transmit it to the uterus. At the moment of fecundation, the fimbriated extremity embraces the ovary, and probably also at each menstrual period.

The OVARIES furnish the ovula which contain the rudiments of the future animals, they are situated in the thickness of the posterior wing of the broad ligaments, behind and below the Fallopian tubes; they are two in number, oblong, oval, whitish, twelve or fifteen lines long, and flattened from before backward, being about the size and shape of an almond. Previous to puberty, and sometimes in virgins and women who have not borne children, their surface is polished and embossed; but after puberty, owing to the escape of the ova, they become rough and fissured. Their superior border is convex and loose; their inferior, straight, and adhering to the broad ligaments, by which they are maintained in position, as also by a special one, named the ligament of the ovary, a dense, imperforate cellulo-fibrous cord which fixes the internal ovarian extremities to the uterus. The external extremities are joined to, or approximate the fimbriated Fallopian extremities. The nerves of the ovaries come from the renal plexus, and the bloodvessels which are called the ovarian, have a similar origin with the spermatic vessels in the male. The situation of the ovaries varies according to circumstances; in the fetus they are in the lumbar region; during gestation they rise into the abdomen along with the body of the uterus, upon the sides of which they are attached; and immediately after delivery, they occupy the iliac fossæ, where they sometimes continue through life. It is not uncommon to find them turned backward, and adhering to the posterior uterine surface. They likewise vary in size, being larger in proportion in the fetus than at maturity, decreasing after birth, enlarging at puberty and during pregnancy, and dwindling away as old age approaches; they frequently become the seat of organic alterations. (*Fig.* 21.)

FIG. 21.

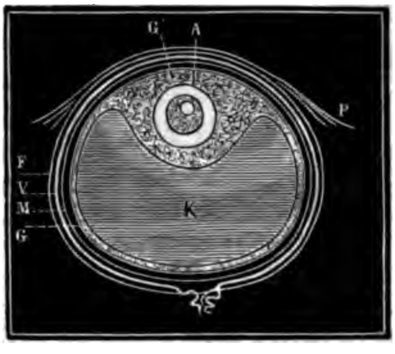


THE EXTERNAL FACE OF THE OVARY.

The external covering of the ovaries is obtained from the peritoneum named the *indusium*. Beneath this covering, the b is invested with a white, dense, fibrous membrane, called the *tunica albuginea*, which is the proper tunic of these organs, and which may be considered as an expansion, or extension of the ovarian ligaments. From the internal surface of this membrane proceed prolongations which divide the ovaries into many small cells filled by their proper tissue. The parenchyma of the ovaries, or tissue proper, is of a reddish brown color, spongy, dense, and vascular, bearing some resemblance to the erectile tissue, it is called the *stroma;* in this tissue are found imbedded a number of small transparent follicles or vesicles, varying in size from the smallest pin's head to that of a large shot, the smaller being within—the larger and better developed more toward the surface. These last sometimes produce small elevations on the stroma, which give a rough or tuberculous appearance to the whole ovary; they are called the *ovisacs*, or *Graafian vesicles*, after De Graaf, who gave a description of them,

The Graafian vesicles number from fifteen to twenty in the adult female, but with the aid of a microscope many more can be seen, which gradually become developed as the others perfect their function. They are hardly visible in children and old women, but are very distinct during the menstrual life. (*Fig.* 22.)

FIG. 22.



THE OVULE IN THE GRAAFIAN VESICLE.

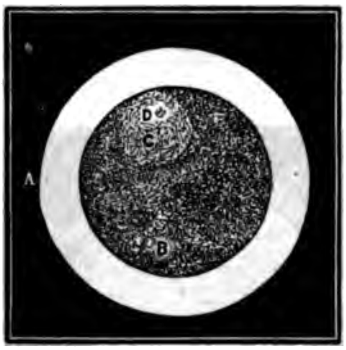
A. The Ovule, about 1-10 of a line in diameter.
G'. The Granular Cumulus, or Proligerous Disk.
K. The Cavity of the Graafian Vesicle.
M. The Mucous Surface.
V. The Vascular Layer.
F. The Fibrous Layer.
P. The Peritoneal Coat.
G. The Granular Membrane.

The vesiculæ Graafianæ, consist cf two separate tunics; 1. The *external tunic* or *tegument*, which is firm, fibrous and vascular in its character, like the stroma or proper ovarian tissue; 2. The *internal tunic*, formed of dense cellular tissue, but thin, smooth, delicate, diaphanous, and easily torn; some consider it destitute of vascularity, which is, again, denied by others. From the close approximation of these two tunics, it is sometimes difficult to separate them.

The internal face or cavity of the inner tunic contains the *nucleus*, comprising: 1. The *granular membrane*, which is a delicate membrane formed of granules or cellules. This membrane is exceedingly thin and very easily torn; its thickest portion corresponds with the free side of the vesicle, or that portion which is nearest the surface of the albuginea, and here the granulations are more numerous, constituting the cumulus proligerus, or discus proligerus. 2. A fluid either limpid, reddish, or slightly lemon-colored, concrescible, and composed principally of albumen, as it is coagulated by heat, alcohol, and the strong acids. In this liquid float, vitellary corpuscles, oil globules, and a great number of small grains, which settle themselves, touching each other, upon the inner wall of the vesicle, and from the above named granular membrane. 3. The *ovule* or *human egg*, which is found in the center of the proligerous disk. (A, *Fig.* 22.)

The OVULE, or HUMAN EGG was first discovered as a distinct organ in the Graafian vesicle by Charles Ernest Baër, though De Graaf had suggested the idea previously. It is imbedded, as stated above, in the midst of the proligerous disk, and is perfectly formed in the ovary during the earlier years of life. It is extremely minute and hardly to be seen by the naked eye, but when examined with the microscope, presents an opaque, rounded appearance. Bischoff says, "The largest human ovules I have seen and manipulated, did not exceed the tenth of a line, being barely perceptible to the naked eye." As seen by the microscope, the ovule is possessed of an exterior covering called the *vitelline membrane*, *transparent zone*, *cortical membrane* or *chorion;* of a substance denominated the *yelk* or *vitellus*, and of a vesicle within the yelk, termed the *germinal vesicle*.

FIG. 23.



A NON-FECUNDATED OVULE OR HUMAN EGG.

A. The Vitelline Membrane, or Transparent Zone.
B. The Vitellus or Yelk.
C. The Germinal Vesicle, or Vesicle of Purkinje, about 1-60 of a line in diameter.
D. The Germinal Spot, from the 1-400 to the 1-660 of a line in diameter.

The *vitelline membrane* is an elastic, thick, hyaline, and transparent membrane, without a determinate texture, whose external and internal outlines assume the appearance of two circular lines inclosing a transparent ring. (A, *Fig.* 23.)

The *yelk* or *vitellus* of the human ovum occupies the cavity of the vitelline membrane; it is formed, according to Bischoff, of a coherent, indistinctly granular, yellowish, transparent, and viscous mass, which does not run out when the egg is cut or crushed; each portion of the zone reserving its particular segment of yelk, or the latter escaping altogether. It usually fills the interior of the vitelline sphere completely, though it is sometimes smaller, and its granulations are placed in juxtaposition with its sole envelope, the transparent zone. (B, *Fig.* 23.)

Within the yelk, or on one of the points of its circumference, is discovered a slightly oval, colorless, and perfectly transparent vesicle, consisting of a very delicate membrane, which incloses a clear and transparent liquid, but which occasionally contains a few granulations. This colorless vesicle scarcely measures the sixtieth of a line in diameter, is surrounded by a mass of deep yellow, and is identical in character with that found in the unfecundated eggs of birds. Fecundation destroys it. This is called the *germinal vesicle*, or the *vesicle of Purkinje* (C, *Fig.* 23.) The honor of its discovery is variously attributed to Purkinje, Baër and Coste, though the latter is more justly entitled to it.

If, according to Wagner, the germinal vesicle be attentively examined with the lens, at four or five hundred diameters, there will be seen on some part of its periphery, a small, dark, round spot, which consists of a collection or stratum of fine, small lenticular granules, or globules, and which stratum appears to be the true living animal germ, existing previously to impregnation. This is called the *germinal spot*, and was cotemporaneously discovered and described by Professor Rudolph Wagner of Germany, and T. Wharton Jones of England. Two, or more germinal spots have been met with in the mammiferæ. (D, *Fig.* 23.)

The ovule, therefore, previous to impregnation, is composed: 1, of an exterior tunic, the *vitelline membrane*, within which is contained, 2, *a yelk*, which again incloses, 3, a vesicle, the *germinal vesicle*, within which we find, 4, a dark spot, the *germinal spot*, or germ from which it is presumed the future man originates, after it has been fertilized by the male semen.

The Graafian or ovarian vesicles experience considerable changes during menstruation, conception, and after impregnation. The investigations of Gendrin, Negrier, Pouchet, Raciboski, Jones, Lee, Patterson, Bischoff, and several others, have led to the belief, which is becoming general among medical men, that the phenomena of menstruation is owing to the development or maturity of these vesicles. Until the period of puberty these ovisacs are hardly discernible, but on the completion of this period, they develop themselves, maturing periodically, in women once in every twenty-eight days. At each period of ovulation or menstruation, a vesicle becomes much enlarged, its upper segment rapidly rises above the surface of the ovary, forming a prominence there about the size of a small nut (A, *Fig.* 24), and the walls of the vesicle become less transparent in consequence of the thickness of the internal

FIG. 24.

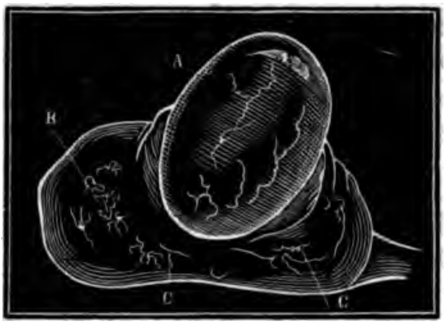


DIAGRAM SHOWING THE OVARY, AND A GRAAFIAN VESICLE AT ITS HIGHEST DEGREE OF DEVELOPMENT, AND JUST BEFORE ITS RUPTURE.

A. The hypertrophied Vesicle.

B C C. Radiated cicatrices left by previously ruptured Vesicles.

membrane, and the hemorrhage that finally takes place in the interior of the vesicle. The quantity of blood effused within the vesicle adding to the amount of fluid it naturally holds, distends it so much as eventually to lacerate or rupture its walls, at a point about a line in extent, the situation of which can be distinguished by its reddish appearance and its more elevated projection. The ovum and contents of the vesicle escape into the peritoneal cavity, or are carried down to the womb by the Fallopian tube; the vesicular walls shrink up, their cavity holding a clot of blood about as large as a cherry, which has oozed from the torn margins, and which, as the vesicular cavity diminishes, is gradually absorbed. The margins of the fissure approximate, giving rise to more or less cicatricula of various forms, being sometimes linear, again radiated, and at others triangular; when recent, they are red, but gradually become brown, forming deep furrows by their retraction.

This rupture of the vesicles not only takes place at the period of impregnation, but also at each period of ovulation; and the scars which are left, instead of being an evidence of so many previous conceptions, as was formerly supposed, are merely the remains of ruptured ovisacs.

CHAPTER X.

OF THE CORPUS LUTEUM.

THE term CORPUS LUTEUM, or *yellow body*, is applied to the remains of the Graafian vesicle, after the ovum has been expelled from it, whether from copulation or from menstruation. And as there has been considerable discussion upon this body, regarding its presence as a sign of conception, it becomes a matter of some moment, in a medico-legal point of view, to determine its true character.

The corpus luteum is a peculiar glandular mass, varying in size from t of a pea to half an inch in length; it is of a dull yellow color, friable in consistence, having a lobulated appearance, with slight convolutions, somewhat resembling a section of the human kidney, and very vascular; according to Montgomery, an injection through the spermatic artery will easily pass into its substance. The *true corpus luteum* is found in the ovary of a recently pregnant woman, and varies in size and appearance according to the period of gestation, gradually diminishing in size, and losing its deep yellow color, until about the fifth month of pregnancy, when it disappears, leaving a small pit over the place it had previously occupied. So that the idea that it is a permanent formation is erroneous. Dr. Montgomery, who has bestowed considerable attention to this subject, thus speaks of its appearance:

"Its center exhibits either a cavity, or a radiated or branching white line, according to the period at which the examination is made; if within the first three or four months after conception, we shall, I believe, always find the cavity still existing, and of such a size as to be capable of containing a grain of wheat at least, and very often of a greater dimension; this cavity is surrounded by a strong white cyst; and, as gestation proceeds, the opposite parts of this cyst approximate, and at length close together, by which the cavity is completely obliterated, and in its place there remains an irregular white line, whose form is best expressed by calling it radiated or stelliform. This is visible as long as any distinct trace of the corpus luteum remains. I am unable to state exactly at what period the central cavity disappears or closes up, to form the stellated line. I think I have invariably found it existing up to the end of the fourth month. I have one specimen, in which it was closed in the fifth month, and another in which it was open in the sixth—later than this I have never found it.

"After the period of gestation has been completed, or the contents of the uterus prematurely expelled, so that gestation ceases, the *corpus luteum* soon begins to exhibit a very decided alteration in all its characters; until, at length, it is no longer to be found in the ovary. The exact period of its total disappearance I am unable to state; but I have found it distinctly visible, so late as at the end of five months after delivery at the full time; but not beyond this period; and the *corpus luteum* of a preceding conception is never to be found along with that of a more recent, when gestation has arrived at its full term; but in cases of miscarriage, repeated at short intervals, it may.

"At the time of delivery the corpus luteum is neither so large nor so vascular as at the earlier periods of pregnancy, except the woman should happen, at the time of her death, to be laboring under inflammation of the uterine system; in which case the corpus luteum partakes of the turgescence of the other parts, and, very remarkably, of their increased vascularity; a striking instance of which is represented in a preparation in the writer's museum, taken from the body of a woman who died of inflammation of the womb, two days after delivery; the central radiated white line is very distinct, and the vessels having been injected, the substance of the corpus luteum is quite crimsoned, and, externally, the ovary continues to exhibit the superficial cicatrix, and the alteration of form produced by the projection of the part containing the corpus luteum."

With reference to the corpus luteum, as a test of conception, there is some diversity of opinion; some viewing the existence of a true corpus luteum, so called, as an infallible test; while others maintain that no real distinction can be made between the true and false corpus luteum, or that which forms independent of impregnation. This question still remains unsettled, though the observations of Dr. Montgomery, which are corroborated by other investigators, as Haller, Pouchet, Haighton, Jones, Lee, Raciborski, etc., seem to confirm the former view; he remarks:—"I have seen many of these virgin *corpora lutea*, as they are unhappily called, and have preserved several specimens of them; but not in any one instance did they present what I should regard as even an approach to the assemblage of characters belonging to the true corpus luteum, the result of impregnation, from which they differ in all the following particulars:

"1. There is no prominence or enlargement of the ovary over them.

"2. The external cicatrix is almost always wanting.

"3. There are often several of them found in both ovaries, especially in subjects who have died of tubercular disease, such as phthisis, in which case they appear to be merely depositions of tubercle, and are frequently without any discoverable connection with the Graafian vesicles.

"4. They present no trace whatever of vessels in their substance, of which they are in fact entirely destitute, and of course cannot be injected.

"5. Their texture is sometimes so infirm that it seems to be merely the remains of a coagulum, and at others appears fibro-cellular, like that of the internal structure of the ovary; but never presents the soft, rich, lobulated, and regularly glandular appearance which Hunter meant to express, when he described them as 'tender and friable, like glandular flesh.'

"6. In form they are often triangular or square, or of some figure bounded by straight lines.

"7. They never present either the central cavity or the radiated or stelliform white line which results from its closure.

"2. They alike fill the tube, before the focus is got, with a brilliant yellow light.

"3. They alike consist of a pellucid fluid, in which float granules, corpuscles containing yellow fluid, oil-globules, and punctiform bodies.

"4. These bodies, placed on the same platine, and diligently compared together, exhibit the same forms, size, tint, and refractive power.

"5. Yelk, boiled hard, is granular and friable; it is coagulated by heat.

"6. Corpus luteum, boiled, becomes hard, granular, and friable — it is coagulated by heat.

"7. Both substances, raw or boiled, stain paper alike of a yellow color.

"8. There is this difference: the crushed mass of corpus luteum contains patches of laminar cellular tela, detritus, and blood-disks forced out by the compressorium; which cannot occur in the yelk, as that is contained within a vitellary membrane, in which its corpuscles are free; whereas, in the corpus luteum, they are confined by the delicate cellular substance lying betwixt the concentric laminæ of the Graafian follicle.

"9. They refract alike.

"10. Projected on a live coal, they alike give out the odor of roasted eggs."

These opinions require further investigation, in order to establish their correctness.

The formation of the true corpus luteum, is thus explained by Ramsbotham: "It has been demonstrated that the Graafian vesicle possesses two membranes; one adhering to the substance of the ovary, the other inclosing the fluid in which the ovule of Baër floats. When a fruitful connection takes place, a great determination of blood is made to that ovary which supplies the germ. The gland becomes larger, rounder, and more vascular than the other; to the touch it feels fuller and softer. But the vascularity is confined to one spot — the neighborhood of the corpus luteum; and the increased size and softness result, not so much from an alteration in the structure of the whole organ, as from the quantity of lymph and fluid blood deposited between the membranes of the vesicle, which is converted into the characteristic yellow gland-like mass. This effusion causes the vessel to be thrown prominently out toward the peritoneal surface; the attenuated coats burst, or rather an opening is formed by absorption, and the fluid, with the ovule previously contained within them, passes into the tube."

PART II.

OF GENERATION.

CHAPTER XI.

THEORIES OF IMPREGNATION.

GENERATION comprises those several phenomena which are necessary to the development or reproduction of organized bodies, and which include, in the human family, the various functions of *menstruation*, *copulation*, *conception*, *gestation*, and *labor* or *parturition*. The particular method by which generation is effected in the organic world, varies according to the character of the organization, being more simple as this approaches elementarity. Moreau has described the several modes somewhat as follows:

1. Generation may be spontaneous, doubtful or unknown, as in case of intestinal worms.

2. It may result from an individual, by division or separation of its parts; *a*, by simple division of the individual, each fragment producing a new individual, as in the instances of *fissiparæ*, or vegetables, cuttings of trees, and animal infusoria; *b*, by separation of a vegetable product, either on the exterior or interior of the individual, as with the *gemmiparæ*, or vegetables, buds of trees, and some polypi.

3. It may be effected by impregnation, requiring the connection of the sexes, and varies according to the character of the sexes. 1st. As in hermaphrodism, or where the sexes are united in the same individual, and which may be divided into, *a*, where the sexes are united in a common envelope, in which instance one individual is sufficient, as with

many vegetables and some mollusca; *b*, where the sexes are separated on the same individual, as in monœcious plants; *c*, with the sexes separated in the same individual, but requiring the connection of two similar individuals, and even reciprocal impregnation, as with gasteropodous mollusca, and worms. 2d. When the sexes are separated on different individuals, and which may be divided into, *a*, without approximation, the parents and offspring remaining unknown to each other, as with diœcious plants, and fishes; *b*, with approximation, but without copulation, the parents knowing each other, but the offspring being ignorant of them, as with the batrachia, or reptiles, frogs, toads, etc.; *c*, with approximation and copulation, as with the majority of insects; the reptilia, chelonia, sauria, ophidia, birds and mammalia.

4. This last method of generation by copulation and approximation, offers great varieties, differing according to the mode of development of the fecundated product, thus; *a*, by incubation, as with insects, and the greater part of reptiles and fishes; *b*, by external incubation, as with birds; *c*, by internal incubation in the parts of the mother, without adhering to them, as with some of the ophidian, and ovo-viviparous animals; *d*, by an organ of gestation, to which the impregnated product adheres, from which it derives the greater part of its nourishment, and from which it separates after a certain time, as with all the mammiferous animals. To this last and most complicated process belongs the generation of man.

The mode in which fecundation is accomplished in the human being, belongs more especially to the physiologist's department to determine; but as the matter has long been a subject of inquiry, and presents a field of interest to many, I will briefly refer to the various opinions that have from time to time been advanced and maintained in the medical world.

In the male, the semen, or spermatic fluid secreted by the testicles, is undoubtedly the agent especially called into action in the function of reproduction; this is manifest from the fact that, removal of the testes not only destroys all sexual propensity, but likewise renders the individual forever after incapable of begetting offspring. The same may be said in relation to the removal of the ovaries in the female; she loses all sexual inclination, the procreative functions are annihilated, and all those graces, emotions, and feelings which distinguish the sex, gradually disappear. Observations have likewise been made in relation to this matter, of a highly interesting character, to some of which a very concise reference will here be made.

Spallanzani, during his investigations, noticed, that as soon as the female frog laid an egg, the male immediately cast a fluid upon it, which soon impregnated it. He then confined the genitals of the male frog in a silk bag, and ascertained that in this condition impregnation could not occur. He, likewise, applied to some of the freshly laid ova, a small quantity of the male semen or fluid which he had previously collected, and impregnation was the result. He also instituted similar experiments on a bitch in heat, and which had been kept confined for twenty-three days before heat commenced, in order to prevent the approach of any dog; the result was, that by injecting nineteen grains of semen into the vagina, at 100° Fah., fecundation followed, and, at the proper period, the animal gave birth to three pups which bore a strong resemblance to herself and the dog from which the semen was gathered. Prevost and Dumas arrived at similar results; they expressed the semen from the testicle of a frog, and after diluting it with water, they placed some ova into it, which became prolific. According to these gentlemen, it is important to dilute the male fluid in order to have the experiment prove successful.

Sir Everard Home, in his "Lectures on Comparative Anatomy," vol. iii, p. 315, records a similar experiment on man, performed by Hunter; the husband was affected with hypospadias, which prevented him from impregnating his wife; Hunter advised him to inject his semen into his wife's vagina through a warm syringe; the result was, she became pregnant.

These experiments, with others of similar character, prove conclusively, that the agents engaged in the generating process, are the semen furnished by the male testes, and the ova of the female. Spallanzani, as well as Prevost and Dumas, determined from further and satisfactory trial, that the fructification of the ova only took place when brought into actual contact with the male semen; thus refuting the doctrine held by some physiologists, that impregnation did not require this mutual junction, but was effected merely by the presence or influence of a seminal halitus or vapor.

Another point of inquiry among physiologists, was, the method by which the spermatic fluid is carried to the ovaries; some contending that impregnation was effected in the uterus, while others maintained that the semen was conducted to the ovaries, and that fecundation was possible even beyond the angles of the uterus; indeed this fluid has been found on the surface of the ovaries, by Adelon, Bischoff, and other investigators. But by what means it reaches the ovaries, has never yet been satisfactorily explained; for the male penis, certainly, has not sufficient power to throw it beyond the uterus.

Various views have likewise been supported at different periods, relative to the manner in which the union of the male and female principles necessary to the formation of a new being, is effected, and how this new being, of whatever species, comes to bear the impress of the mental and physical features of one or both parents. But the solution of these particulars is still involved in mystery. The oldest theory on this subject, is that of *epigenesis*, which holds that the new being is created entirely anew, and at the moment of conception, receives at once the materials necessary for its formation, one portion being derived from the testes of the male parent, the other from the uterus or ovaries of the female. Aristotle, Galen, and others, supposed that the materials furnished by the female was the menstrual fluid; and Hippocrates considered that the female supplied all the substance required for the development of the future being, while the male fluid merely contained that vivifying principle necessary to impart vitality to the female materials. This theory of epigenesis, with various modifications, was the prevailing one for many years, and was for a time renewed by Buffon in the beginning of the seventeenth century, whose views were entirely speculative and untenable. His notion was, that the growth and nourishment of individuals during youth, was effected by certain organic molecules common to both sexes; but which being required in less quantities for these purposes at maturity, the predominance was emitted by the male testes with the spermatic fluid, and also by the ovaries, or female testes, as he termed them, for the purpose of reproduction of the species. He imagined that the body of each parent supplied each of these molecules with atoms derived from its various parts, and that whichever parent afforded to the newly organized being the major portion of these molecules, the resemblance to that parent would be the most marked.

During the sixteenth century another theory was originated, being based upon the investigations and discoveries of the physiologists of that period, among whom may be named, Leeuwenhoeck, Harvey, De Graaf, and others. It is termed the theory of *evolution*, and was strenuously supported under some form or other, during the whole of this century. The adherents of this theory maintained that the germ of the new being existed in only one of the parents, while the other furnished the principle which communicated life to it. They were divided into ovarists, and animalculists or spermatists. The ovarists, among whom I may mention Harvey as the principal, having discovered numerous small vesicles in the ovaries, which apparently decrease according to the number of conceptions, held that these vesicles were the fetal germ, which only needed the animating power of the male semen to usher the new being into existence. But this view was objected to by many, on account of its exclusiveness, whereby the male fluid had but a minor part to perform; beside which, if the semen merely exerted a vivifying influence upon these vesicles, it did not explain why the offspring so often resembled its male parent.

In consequence of these objections, a different opinion was supported by those who were called animalculists, and which originated principally from the microscopic discoveries of Leeuwenhoeck and other investigators, who found myriads of animalcules in the male semen. These held, that after having been thrown into the uterus during copulation, the animalcules perished, with the exception of one or two, which, entering the Fallopian tubes, were conveyed through to the ovaries, and there deposited and nourished in a nidus formed by the ovum. As this spermatozoid progressed in growth, it ruptured the nidus which inclosed it, and was again conveyed to the uterus to be nourished and preserved until the period of parturition. To this view, wherein the female merely supplies the nourishment for the embryo furnished by the male, an objection similar to the one above is suggested, as to the cause of resemblance, in many instances, to the female parent.

Those who desire to have these several views more in detail, are referred to the several physiological treatises in which they are fully related and discussed; and as they have become at the present day obsolete, a mere glance at them was deemed all-sufficient in the present work. But, before terminating this subject, a reference to the views of physiologists of the present day must be made, without which, this portion of our work would be imperfect.

In Part I, will be found a description of the ovaries, Graafian vesicle, ovule, germinal spot, etc.; these are the discoveries of recent physiological investigators, and have been the means of effecting a revolution in relation to the views of impregnation, giving rise to a theory, *the ovular theory*, which is, undoubtedly, more in proximity to the truth, than any of the previous doctrines which have been held on this subject. The theory is, that the egg, ovum or germ is supplied by the female, in whom it exists in indeterminate quantities; that at the age of puberty, these germs commence maturing; at their period of ripening, they rupture the vesicular tissue in which they are contained, and pass from it, being accompanied by a sanguineous discharge called menstruation or ovulation, the appearance of which is significant of the fact that the female has reached the age at which she is capable of giving birth to children: these ovules escape either into the peritoneal cavity, or into the womb through the Fallopian tubes, and pass off with the menstrual flow, or are retained in consequence of fecundation.

On the other hand the male supplies a fluid in which is contained minute, round and granulated bodies, *the spermatic granules*, as well as bodies possessed of motion, like the epithelial cells, which are not, however animalcules, but more properly spermzoons or spermatozoids; these bodies, by some unknown power of force, attraction or velocity, are conveyed to the uterus tubes or ovaries, when coming into contact with the nude, uncovered ovum, through some inscrutable agency, probably an intermingling or mutual permeation of the male semen and female germ, animalization takes place, and a creature is brought into existence, which, possessing certain elements derived from each parent, will necessarily present mental and physical resemblances to either or both of them.

Repeated experiments on animals have proved, that any obstacle to this contact of the germ and semen, will prevent conception.

CHAPTER XII.

MENSTRUATION—CONCEPTION.

At a certain age the female reaches the period of puberty, which is made manifest by a sanguineous discharge from the uterus, occurring periodically once a month, and which is called menstruation or ovulation. It has likewise many other names applied to it, as *menses*, *catamenia*, *courses*, *terms*, *periods*, *monthly sickness*, *menstrua*, *flowers*, *monthlies*, *times*, etc. It is not a secretion, but an effusion or hemorrhage, very much resembling venous blood, and is undoubtedly blood rendered impure by the addition of mucus and epithelial scales with which it meets during its flow.

As a general rule, the discharge, in females of this climate, is established at the fourteenth or fifteenth year, though it varies with some, oftentimes appearing as early as the twelfth or thirteenth year, and again not until the seventeenth or eighteenth. In the former instance, it is termed precocious menstruation, and is significant of an unnatural increase or development of certain organs, at the expense of others; it is commonly followed by premature death, especially if an early marriage resulting in pregnancy, should take place, in consequence of these unseasonable and abnormal indications of puberty. In the latter instance, the term, tardy menstruation, is applied, and which is usually the result of some debility or disease, that may eventually destroy the female.

Climate, constitution, education, modes of life, etc., affect the appearance of this discharge; it being earlier in warm climates than in cold, and in city females than in those of the country. It likewise appears earlier and more abundantly in females of a nervous temperament, than in those who are phlegmatic.

The period of ovulation is one of the most interesting in the life of a female, and is ushered in by many symptoms and changes in her mental and physical developments, that manifest themselves gradually. A remarkable advancement toward the perfection of the reproductive organs is presented; the ovaries rapidly enlarge, and change from their previous long, flat and smooth condition, to one in which they are large, oval, rounded and embossed; the Fallopian tubes become elongated, their fimbriated extremities widened, and the fimbriæ enlarged; the uterus becomes more fully supplied with blood, and its tissue more florid; the body and fundus likewise obtain more rotundity and development than the cervix, which appears proportionally shorter and narrower; the vagina is widened and dilated, and its vascular structure is supplied with increased quantities of blood, and its mucous folds augment in number. The pelvis becomes larger and wider, with a diminution of its inclination forward; the pubic region more prominent, round, and covered with hair; the labia pudendi more amplified, red, and sensitive; the hips more projecting, and inclined outwardly; the pelvic cavity enlarged; and the breasts rounder, full, and prominent, with the nipples projecting, more sensitive, and the areola of a darker hue. The whole person improves in grace and elegance, and the voice becomes more sonorous and melodious.

Corresponding with these modifications of the physical system, are changes in the mental character; the gay, light-hearted girl, loses her playfulness, and assumes the dignity of womanhood; she becomes more reserved, more sensitive, and full of sympathy; she manifests strong attractive feelings toward the opposite sex, and seeks to love as well as to be loved; the social and moral sentiments become of a purer and more exalted character; a great fondness for children is displayed; and in her we find the most perfect combination of modesty, devotion, patience, affection, gratitude, loveliness, and Christian virtue.

The menstrual discharge being a sign of maturity and fertility of the reproductive organs, it does not appear during childhood, nor in old age, usually ceasing at the ages of from forty to fifty, though occasionally it extends to a very advanced age. The period of its cessation is termed the "turn of life," or "the critical time of life," from which time women cease to bear children, and on account of the various unpleasant, and often serious symptoms presenting at this period, its approach is much dreaded by nearly all of them.

The amount of fluid expelled, varies in females, averaging from six to eight ounces; some will lose only four ounces at each ovulation, and others twelve, and yet each will remain in health, because the system of each is controlled and affected according to its individual wants, habits, strength, and activity. The discharge usually continues from three to six days, occasionally from eight to ten, and must, as a general rule, have revealed itself before impregnation can take place. Yet I have known several females who became mothers without ever having had any previous menstrual flow; these, however, are the exceptions, and depend upon causes of which I confess myself ignorant. In the above cases, however, menstruation occurred at the proper period after parturition, showing that the previous non-ovulation, depended upon neither malformation nor malorganization. In no one of them was the female less than sixteen years old, and accouchement occurred within twelve months from the nuptial rites. All cleanly women wear a napkin during ovulation, which is retained in its place in a manner similar to a T bandage, for the purpose of concealing their situation, which it does by absorbing the fluid discharged; from four to twenty of these napkins will be worn during one menstrual term.

As has been observed in another place, the menstrual hemorrhage is merely the periodical phenomenon of that function which matures and discharges an ovule from the ovary, and fecundation, as a general rule, can not take place without the healthy and perfect performance of this function. At this period there is a plethoric, hyperæmic or excited condition of the uterus and other reproductive organs, accompanied with an exhalation of blood from the uterine vessels, all of which symptoms are relieved by the escape of the ovulum, and the sanguineous flow. This discharge is liable to several derangements, as amenorrhea, dysmenorrhea, menorrhagia, etc., which do not properly come within the limits of this work, but which will be fully treated of in my forthcoming work on "Diseases of Women."

An ovum may become impregnated, and yet conception not ensue, because it may pass into the uterus, and fall from thence into the vagina, and thus be lost; or it may be removed by hemorrhage, or mucous discharges. Conception takes place, only when the fecundated ovulum becomes attached or adherent to the uterus, Fallopian tubes, etc. Hence women may be often impregnated, and seldom conceive.

The period during which conception takes place most readily is immediately after ovulation, yet, physiologists have not agreed on this point. Ritchie supposes that the escape of ova is not limited to the menstrual period, but is taking place constantly, and consequently that fecundation is possible even during the intervals between menstruation. Raciborski and Pouchet, are of opinion, that the act of copulation may accelerate the ripening of the ova, by exciting the ovaries to a more vigorous play of their functions. To this view Prof. Meigs objects, and as I believe, with good reason; he says, "As to the impression still entertained by some reputable authors, that the discharge of the ovule depends upon the aphrodisiac orgasm, it is too unreasonable an hypothesis; too unreasonable, I say, because, the dehiscence being the effect of absorptive power, and not of a lacerative or vulnerative force, it is idle to attribute to a momentary orgasm, which perhaps has no direct influence on the circulation within the ovaries, a result that requires for its effectuation many days of the slow operation of the absorbents of the ovarium."

Bischoff remarks, "During the years in which a woman is susceptible of impregnation, an ovum ripens, and is separated from the ovary every four weeks, this phenomenon being accompanied by simultaneous hemorrhage from the uterus. This periodical maturation of an ovum, is the first and most essential condition of conception and pregnancy. *At this time alone will coitus be followed by conception;* at all others this last will be impossible." Raciborski believes that continence for three days previous to ovulation, and nine days subsequently, will very much lessen the chances of fecundation; he observes that few women conceive at a distant period from the catamenial flow, and states, that "of fifteen women who specified accurately the period of their latest menstruation, as well as the dates of the connubial act, five evidently conceived from coitus taking place from two to four days previous to the period at which the catamenia was due. In seven, conception dated from coitus occurring two or three days after menstruation; in two, it took place at the actual period of the catamenia; and in one, so long as ten days after the latter had disappeared." Nægèle observes, that the calculation of nine months and eight days from the last appearance of the menses, has never, in his investigations, failed to fix the term of gestation.

Pouchet asserts that only within the first twelve days after menstruation, is impregnation possible, and Prof. Meigs supports him in this view. Yet there are recorded instances which prove the reverse of this, as, the case reported by Montgomery, in which fecundation was effected three days previous to the catamenial discharge; the reported case of Dewees, in which it was accomplished within a week of the menstrual period, etc.

Notwithstanding all this diversity of opinion relative to the subject, the investigations of physiologists undoubtedly prove that the chances of impregnation increase the sooner coitus ensues after menstruation, and that after the eighteenth or nineteenth day from this function, they become very much diminished. As to the conception following an embrace, which happened several days previous to the menstrua, I would suggest, that it is possible, the vitality of the male semen or spermzoons may be preserved within the female organs for some time, and consequently, if they thus exist until the period at which the discharge of the matured ovum occurs, contact between the two, would effect its necessary result. That this is a reasonable view of the matter, cannot be doubted, especially when we remember that Bischoff, Wagner, and others, have found living spermzoons in the vagina, uterus, tubes and ovaries of animals, upon which they experimented, for some hours after copulation.

But, however interesting these discussions and investigations may be to the physiologist at the present day, they are of no importance to the accoucheur in a practical view, and as a labored exposition of the facts and opinions recorded concerning them is not actually necessary in a work like the present, I have, therefore, endeavored to be as brief and limited as a mere glance at the subject would admit.

CHAPTER XIII.

OF PREGNANCY.

When the fecundated ovum becomes attached to some portion of the uterus, conception is said to have taken place, and the peculiar condition of the woman, from the moment of conception to the period of parturition, is called *pregnancy* or *utero-gestation;* this usually comprises nine calendar months, or two hundred and eighty days from the last menstrual show, or one hundred and forty days after quickening—the time at which most females perceive the first motions of the fetus, and which generally occurs about the twentieth week after conception. Although this is the period which seems to have been generally recognized from the earliest ages, yet it is not invariable, as it occasionally terminates sooner, and again, may extend to even ten months, of which there are well attested cases on record. The determination of this subject is one of great difficulty, as we can seldom ascertain the precise moment of fecundation, and yet it is one of immense importance, from the fact that the legitimacy of the offspring may depend upon a correct decision.

The only method by which we can ascertain the commencement of utero-gestation, is by reference to the period of the last menstrual flow, as well as to the time of quickening; but even these means are very uncertain, as conception may occur sometime during the intermenstrual period; beside which, the period of quickening varies in different women. On account of these difficulties, laws have been established in several nations, fixing the term within which legitimacy is acknowledged by them; thus, in France, the "Code Napoleon," admits the legitimacy of a child born within three hundred days after wedlock, divorce, or death of the husband; and if born after that time, its legitimacy may be contested, though it is not to be viewed as a bastard. In Prussia, three weeks beyond the usual time are allowed, or three hundred and one days. In Scotland, ten calendar months are considered the extent of legitimacy. In England and in this country, the limit of gestation is not determined by law.

That the term of utero-gestation varies in many females is, I believe, generally admitted by observing accoucheurs of the present day, and the existence of the laws on this subject, in the countries above referred to, are strong confirmations of the possibility of protracted gestation. Indeed, I have met with several instances in which I had every reason for believing that the pregnancy had been prolonged to two and three weeks beyond the usual period; and two, in particular, in which I positively know that gestation was continued for ten months. Drs. Blundell, Desormeaux, Hunter, Montgomery, Rigby, Hamilton, Burns, Dewees, Atlee, Velpeau, Merriman, Moreau, and many others, have met with similar instances, in which the term of gestation had extended from one to four weeks beyond nine calendar months. Their reported cases, in connection with investigations made on animals, as rabbits, sheep, cows, mares, etc., that likewise are found to vary considerably in their periods of gestation, certainly afford the strongest evidence in favor of prolonged pregnancy. Relative to this subject, Dr. Montgomery justly observes: "We cannot imagine why gestation should be the only process connected with reproduction, for which a total exemption from any variation in its period should be claimed. The periods of menstruation are, in general, very regular; but who is there who does not know, that as there are, on the one hand, women in whom the return of that discharge is anticipated by several days, so there are also many, in whom the return is postponed an equal length of time, without the slightest appreciable derangement of the health. Again, menstruation and the power of reproduction in the female, very generally, indeed almost universally, ceases about the forty-fifth year, in these countries; yet occasionally instances are met with, in which both are prolonged ten or fifteen years beyond that time of life: and a similar variety is observable, in the period of the first establishment of that function in the system. If we turn our attention to brutes, the conditions of whose gestation so closely coincide with those of the human female, and are less disposed to have it disturbed, we cannot for a moment doubt the fact, that there is a great irregularity in the term of gestation in different individuals of the same species."

Another point to determine, is the earliest period at which a child may be born, consistent with its existence subsequently. This is likewise a subject of much moment, involving the reputation of a mother, the legitimacy of offspring, and the peace and happiness of families, especially in those instances where the fetal developments exceed those which are generally found at the various periods of pregnancy. I remember an incident which occurred some years since, and which I will relate here, to show the importance of prudence. I was called to attend a lady who had aborted three months after her marriage: the fetus presented all the appearances of one between the fourth and fifth months, and on seeing it, I innocently remarked, "it is a good-sized one." This imprudent remark occasioned much unhappiness in the minds of the husband, the mother of the lady, and herself: and they each inquired of me, in private, if I supposed there "was anything wrong?"—having reference to the wife's chastity. I had long known each of the parties, before their marriage, and had no reasons whatever for the most distant idea of want of purity and virtue, and it was from this consciousness of undoubted integrity of character, that the observation was inadvertently made—and I so replied to their inquiries. About eighteen or nineteen months afterward, I delivered this lady of a male child, at full term, which having been weighed on the day of its birth, was found to exceed twelve pounds. Here was an extraordinary development of size at full term, and a similar excess of growth was undoubtedly the case with the previously aborted fetus.

The seventh month is generally viewed as the shortest period in which a viable child may be born, yet there are many instances in which it has occurred still earlier. Dr. Dewees states, that he has known instances of this kind: one "in which labor habitually occurred at the seventh month, and two, in which it regularly took place at the eighth month of pregnancy." In Scotland, a child born six months after marriage, or after the death of the father, is considered legitimate. Carpenter, in his Physiology, mentions an instance in which a child, born twenty-five weeks after wedlock, lived between six and seven months, and was declared to be legitimate by the Presbytery of Scotland. Dr. Dodd and Dr. Christian, relate similar cases, as well as many other physicians. Dr. W. Hunter observes, that "a child may be born alive, at any time after three months; but we see none born with powers of living to manhood, or of being reared, before seven calendar months, or near that time. At six months it cannot be." The fact that a child, born at the seventh month of gestation, may subsequently continue to live, is of importance in another point, viz: the induction of premature labor.

Upon these various deviations from the most common course of pregnancy, it is not my intention to offer any speculative views, as the present work is intended to be, not one of theorizing, but of utility, in a practical point, to those who consult its pages; I will, therefore, leave this subject, by observing, that an opinion in these cases should always be given very guardedly and reservedly, lest by a hasty and improper decision we tarnish the reputation, and consequent happiness of the innocent.

It sometimes happens that the ovum, after impregnation, does not reach the cavity of the uterus, but becomes attached to the interior walls of the Fallopian tubes, abdomen, etc., in consequence of which, from want of a proper and natural connection with the mother, the development of the ovum is much retarded, is seldom perfected, and disease often attacks it; under these circumstances, a well-formed, living fetus could not be produced. I am aware, that some writers object to these facts as being without foundation; but the objections are commonly presented by those who support the theory that the male semen never extends beyond the uterine cavity, within which, alone, fecundation occurs. As before stated, the spermatic fluid has been found in the tubes, and on the ovaries of various animals by rigid investigators; beside, the fact that fetal formations, without the uterus, do occasionally exist, is, in connection with the above, an evidence tending, to say the least of it, to support a belief of the possibility, as well as probability, of fecundation occurring beyond the uterine cavity.

When the impregnated ovum reaches the uterus, and is developed within its cavity, it is termed a *normal*, or *uterine* pregnancy, which is divided into *simple uterine pregnancy*, when there is but one fetus; *compound*, or *multiple pregnancy*, when there are more than one; and *mixed*, *complex*, or *complicated pregnancy*, when, with the existence of the fetus, there is also, a mole, hydatids, or some morbid condition of the uterus, or its appendages. When, instead of passing into the uterus, the vivified ovulum becomes fixed upon the tubes, abdomen, etc., it is called *extra-uterine pregnancy*, of which there are several varieties, according to the place of adhesion of the ovum, and which I will refer to hereafter. To those pathological conditions which simulate pregnancy, often misleading both the patient and her physicians, and which occur independently of true conception, the term *false pregnancy* has been improperly applied.

CHAPTER XIV.

SIGNS OF PREGNANCY.

PHYSICIANS are frequently consulted to decide the existence or non-existence of pregnancy, in cases where it may be of immense importance in determining the reputation of a female, the legitimacy of a child, or even the life of a new being, and in instances when a pregnant woman is condemned to capital punishment. Hence, a knowledge of the signs common to pregnancy, cannot be too thoroughly understood by the accoucheur. Women with illicit offspring, when suspected and interrogated, will almost always endeavor to mislead us by an obstinate denial, and even by an appearance of much indignation; and this will usually apply to all females, whether married or not, who desire to abort, or destroy their conception. We cannot therefore be too cautious in giving full credence to the statements of any female upon this subject, unless we have a sufficient acquaintance with her to justify implicit confidence in her assertions; and we should always depend upon our own knowledge of the symptoms, rather than to any light we may elicit from the female.

Again, in cases where there is no desire or interest to deceive, as when pregnancy is suspected from the presence of abdominal enlargement, suppressed menstruation, morning sickness, etc., it will often require all the skill of the physician to diagnosticate correctly, and, if an incorrect opinion is pronounced, it will frequently place him in an extremely mortifying situation. It is not many years since, that a celebrated Professor plunged the trocar into the gravid uterus and shoulder of the fetus of a lady, whose condition he mistook for dropsy; I knew an instance where a female, supposed to have erred, was examined by two or three physicians, who decided that she was some three or four months advanced in pregnancy; she denied the charge, but it was of no avail, her friends forsook her, and even her parents became harsh, severe, and cold toward her; she pined away in secret, hiding her grief from the world, and in a few months died. An investigation being held, a morbid growth within the uterus disclosed the true cause of her symptoms. Many instances of similar character might be here related, showing the value and importance of a full acquaintance with all the signs which are to guide us in our investigation and decision. We should exercise great discretion, and rely entirely on the indisputable evidence of our senses; not forming our opinion on one symptom, but on a combination of unquestionable symptoms, and if the least doubt be entertained, we should unhesitatingly express it; for it is much safer to remain in uncertainty, than to pronounce an incorrect diagnosis. Females usually suppose themselves pregnant, when after intercourse, they find a cessation of menstruation, followed by enlargement of the abdomen at a proper time and fetal movements, and generally they are correct, yet all these signs may be apparently present without conception.

To determine a recent conception is not only difficult, but as far as the physician is concerned, absolutely impossible; yet many females resolve this point very correctly, from certain voluptuous sensations, peculiar to each, individually, experienced during a fruitful copulation; and where they have previously given birth to children, having felt similar sensations at the period of fecundation, we have on subsequent occasions, when these occur, some grounds for believing them to be again pregnant. Yet it is commonly the case that "cold women," as they are called, are more easily impregnated, than those warm, ardent, amorous beings, who, during copulation, enjoy exquisite voluptuous sensations, with spasms, and nervous agitation.

The dryness of the penis when withdrawn after an embrace, and the retention of semen by the female, are looked upon in some sections as undoubted evidence of fecundation. An anxiety or depressed condition of the woman a few days afterward, paleness of countenance, a dull, sunken, languishing appearance of the eyes, with a bluish circle surrounding them, spots on the face of various sizes, and swelling of the neck, have all been enumerated as signs of early conception, but they are extremely uncertain and

It is only when pregnancy has somewhat progressed that we are enabled to diagnosticate with any degree of confidence, and the more advanced this is, the more correctly can we decide. The signs of pregnancy are divided into the RATIONAL and the SENSIBLE; the rational are again subdivided into *general*, *local* and *sympathetic*.

The *general signs*, are those which result from increased activity of the nutritive functions, and from the modifications which take place in the nervous system. The pulse is more frequent and strong, full and hard; occasionally, in the latter months, intermittent and contracted; the blood is said to be buffy and more plastic; respiration is more active with an augmentation of the heat of the body; and all the secretions are more abundant, with increased odor. The changes in the nervous system are usually the greatest and most remarkable. The sensibilities become more refined, the female becomes more susceptible as well as more liable to moral and physical influences; sometimes her nature appears completely changed, so that those who were kind, loving and amiable, become peevish, irritable, jealous and malicious, and vice versa; the silent become loquacious, and the talkative become taciturn; in some, the intellect becomes more active, and they are rendered more subject to nervous derangements. If diseases are already existing in the female their further progress is either retarded, or more rapidly hastened toward a serious termination. Pregnancy renders the female system more liable to disease, constituting a condition called *puerperal*, which is induced by conception—is more fully developed as pregnancy advances—and reaches its maximum point at childbirth; it then gradually diminishes until after lactation, when it ceases; manifesting itself again, in a greater or less degree, during every subsequent pregnancy. It is owing to this puerperal condition that pregnant and lying-in women are more liable to epidemic and other diseases, and which are usually more rapid and severe at this time than during the ordinary state and habits of the animal economy. Although these signs are indicative of pregnancy, yet in the early months they are very obscure, and when taken by themselves at any period, very uncertain, affording very little aid in diagnosis unless associated with the others hereafter mentioned.

Among the *local signs*, that upon which females place the greatest reliance, is the *suppression of menstruation;* this is, to be sure, a valuable and most important indication, and one that is very common with pregnant females, yet too much confidence must not be placed in it as an unerring sign. It often happens that women fail to menstruate for one, or several periods in succession without conception being present, and this may or may not be accompanied with an augmented protuberance of the hypogastric region. This suppression may be owing to cold, functional or organic disease of the reproductive system, or other cause, which should always be carefully investigated with a view to a correct solution. Again, there are many instances where menstruation is present during pregnancy—others, where females have conceived without any previous monthly flow, and, occasionally, some ovulate regularly only when pregnant. Usually, when the catamenia have failed in non-pregnant females, there is a greater or less derangement in the general health, but when the health continues in its ordinary condition, with a gradual enlargement of the abdomen, morning sickness, and the darkened areola, we have strong reasons for suspecting pregnancy, especially in the married woman. In the unmarried, where illicit commerce is strenuously denied, the diagnosis will be involved in much uncertainty and difficulty; yet the physician should not bestow a too ready credence on the statements of his patient, but rather postpone a positive declaration, until the other signs have advanced so far as to give an undoubted indication of the true state of the case. When the least doubt exists in the mind of the practitioner, he should be very particular not to prescribe or administer any remedies tending to the restoration of the monthly evacuation.

A *change in the color of the vulva*, from its natural pinkish hue, to a bluish tint, has been named as a sign of pregnancy; but as this is probably owing to an obstructed circulation, pelvic tumors or other abnormal conditions may produce it. It is usually more marked when the female is in the erect or sitting posture, and disappears more or less in the recumbent.

A *change in the color of the skin*, called *ephelis*, and sometimes *morph*, or *mask*, accompanies many women during every pregnancy. It is a brownish, yellowish, or earthy colored stain or freckle, of greater or less extent, usually occupying the forehead, cheeks, and even the neck and breast, but is not a constant sign of pregnancy. It is a minor sign, and one, probably, more important among those females who have been disfigured by it in previous conceptions. It often becomes permanent, remaining after parturition, and occasioning considerable uneasiness to the female; at this time efforts may be made to remove it. I have succeeded in several instances, by employing as a lotion, the saturated aqueous solution of Sulphuret of Potassa, to be applied on the stain three or four times a day, in connection with small doses of a mixture of Rhei. 2; Leptandrin, ½; and Bicarbonate of Potassa, 1; to regulate the bowels and restore the cutaneo-hepatic sympathetic relations; but a subsequent conception has always brought with it a return of the dark spot.

The *sympathetic signs* are usually confined to the digestive system, and are only useful as means of diagnosis when taken in connection with the more positive sensible signs; they sometimes become so severe and troublesome as to require treatment, for which the reader is referred to the chapter on "Disorders of Pregnancy, and Treatment." Among the sympathetic signs are *nausea*, or *morning sickness*, *vomiting*, *anorexia*, *pica*, *malacia*, *acidity of stomach*, *heartburn*, and *toothache*, which are more common in the earlier months of pregnancy, gradually disappearing in the latter months, being followed by constipation, hemorrhoids, and more or less headache.

All the rational signs, of whatever subdivision, are only important when accompanied with the sensible signs, and when they occur together, the diagnosis is rendered more easy and certain.

The SENSIBLE SIGNS are subdivided into the *visible*, the *audible*, and the *tangible*.

The *visible signs* are those which may be recognized by the eye, as *enlargement of the mammæ*. The breasts, during the earlier stages of pregnancy, acquire new life from sympathy with the uterus; the lactiferous glands are aroused into action, the breasts increase in magnitude, becoming round, tense, hard and tender, with frequently a pricking sensation in them, which sometimes continues during gestation, and at other times the enlargement diminishes about the fourth or fifth month, and may not appear again until near the period of parturition, or even subsequently. Occasionally the axillary glands enlarge.

Simultaneously with the augmentation of the breast, or about the commencement of the third month, the nipples increase in size, and sensitiveness, and are sometimes quite painful, they become of a deeper red, and it is often the case that a yellowish or milky fluid can be obtained from them. The surrounding skin likewise becomes tense, thin and more transparent, and the veins more conspicuous. The enlargement of the breasts, and increased size of the nipples are most commonly present during pregnancy, yet taken alone, they can not be depended on as signs, for pregnancy often exists without them, and again, they may originate from other causes, as ovarian or uterine tumors, amenorrhea, etc.

The *areola*, shortly after conception, becomes changed from its natural pink color to a deep brown, and which is a more valuable sign in first pregnancies than succeeding ones, as in the latter it would be difficult to decide whether the change was owing to the former pregnancy, or the one under examination, especially, if only a short time has elapsed between them. By some medical men, especially Smellie, and Hunter, it was viewed as a positive sign of pregnancy. Cazeaux says, "and I should diagnosticate the existence of pregnancy, with a degree of confidence, in a young woman who had never borne children, and whose breasts presented both a brownish-colored areola, the tubercles (sebaceous glands), and the freckled characters before described." But, notwithstanding, this sign has its objections; it is sometimes absent during pregnancy—it may be modified by the color of the skin, being more distinct in women with dark hair and eyes, and less so in blondes and brunettes; and it has been present when conception did not exist, being induced by disease, as amenorrhea, or organic disease of the ovaries, or uterus; all of which should be considered during the investigation.

With this alteration of color, the papillæ, or sebaceous glands which are seated under the skin of the areola, and especially near its margin, become enlarged, appearing like small tubercles, and which is considered a more positive sign of pregnancy than the areolar discoloration.

The *secretion of milk*, is a sign of some value; yet the accoucheur must remember, that it has occurred in females who were not pregnant, likewise in children; and that cases are on record, where milk has been obtained from the breast of the male. In females, this secretion may be present in consequence of the sympathy existing between the breasts and the reproductive organs in a state of disease; instances of which are frequently met with; consequently, this sign is only of importance when attended with others of a positive character.

Enlargement of the abdomen, affords to the public a strong presumption of pregnancy, because it is an invariable concomitant of this condition. Yet a mere dependence on this sign will often deceive us, as it may be present from many other causes than pregnancy. Thus, the accumulation of adipose matter in the omentum, and walls of the abdomen, ascites, uterine and ovarian tumors, amenorrhea, tympanitis, etc., will cause its enlargement. An appreciable increase of size, in the abdomen, is commonly observed about the third month, and if with it we have enlargement of the breasts, discolored areola, cessation of menstruation, with usual health, and previous morning sickness, the inference is strong that conception exists; yet even these may mislead us; hence, the necessity for great caution in forming a diagnosis on this subject, cannot be too strongly enforced.

Previous to the third month, or soon after conception, the abdomen generally becomes flat, its anterior wall retracts, and approaches toward the vertebral column; but about the third month, it commences to project, first on the median line, gradually increasing and extending from the pelvic to the umbilical and epigastric regions, reaching this last at full term, and leaving a sunken, or depressed appearance over the iliac fossæ. In women who have had several children, the abdomen inclines more forward and downward, from laxity of the parietes, while with those in their first pregnancies it is usually less projecting, but larger and more uniform. The volume of the abdomen, at different stages of gestation, likewise varies from several circumstances, as twins, amniotic dropsy, etc. If, with the above appearances, we ascertain that the umbilicus is sunken at first, and then becomes gradually more prominent as the projection of the abdomen proceeds, our suspicions of pregnancy are still further corroborated. During the latter months of pregnancy the umbilicus may be thrust forward from one-fourth of an inch to even an inch beyond the anterior surface of the abdomen; and this projection may also originate from the presence of pathological tumors within its cavity.

Quickening, a term applied to a fluctuation, or fluttering sensation, experienced about the end of the fourth month, may be mentioned in connection with the augmentation of the abdomen. By some authors this is considered as the result of life being imparted to the fetus at the time it is felt; by others, it is viewed as being caused by the impregnated uterus when rising from the pelvic excavation, etc. It is undoubtedly owing solely to the fetal movements, which take place as soon as the embryo attains size and strength sufficient to make its motions felt by the mother, and which generally commences about the eighteenth or twentieth week of utero-gestation. However, pregnancy may exist, and no quickening have been experienced by the mother; again, females often mistake other sensations for this symptom, as a flatulent motion, etc.; yet, if the sensation continues to increase in strength, until the fetal movements can be distinctly felt, all doubts will of course be removed. If, during the latter months of gestation, firm and continued pressure be made by the fingers against opposite sides of the uterus, it will produce such disturbance to the fetus, as to make it move vigorously; or, if one hand be placed on one side of the abdomen, and the same point on the opposite side be struck with the other hand, the fetus is very apt to move actively. The motions of the child, if it be alive, may likewise be determined, by dipping the hand in a bowl of cold water, and applying it suddenly over the abdomen. It must be borne in mind, that although the motions of the fetus are a strong evidence of pregnancy, yet its absence does not prove the reverse condition, as the child may be dead, or very feeble. In the strict sense of the word, *quickening really* occurs at the period of conception.

Among the *visible signs*, may be named a peculiarity observed in the urine of some pregnant women, first described by M. Nauche, in 1831, and after him by several other gentlemen. The urine on being allowed to stand in a glass, for some twenty or twenty-four hours, presents on its surface a number of brilliant, crystalline granules, resembling small specks, or oblong filaments, irregularly isolated, which often unite, forming a transparent layer or pellicle about a line in thickness, which can only be seen in certain positions. After a few days a portion of this pellicle gradually falls to the bottom of the glass, forming a white, milky crust there. At one time this pellicle was considered a positive proof of pregnancy, but recent investigations by Dr. E. K. Kane of Philadelphia, have determined, that *kiesteine*, the name given to this material, is not peculiar to pregnancy, but may occur during the presence of milk in the breasts, especially if it be not freely discharged from the mammæ, and that its presence is rather an indication of the existence of this mammary secretion, than of pregnancy.

The *audible signs*, are those detected by the ear, with or without the aid of the stethoscope, among which is, the *placental sound*, or *bruit de souffle*, which is variously represented as resembling the blowing of air, the cooing of a dove, the drone of a bagpipe, having a peculiar rasping sound, similar to that which is heard in the carotid arteries of chlorotic females, in varicose aneurisms ,and in some cardiac affections; this sound is owing to the arterial and venous circulation of the walls of the impregnated uterus, as well as to pressure upon the arteries, and not to the utero-placental circulation; it is always synchronous with the mother's pulse, and is occasionally heard in the course of the linea alba, but more frequently on the sides of the abdomen, over the course of the iliac arteries; sometimes it can be heard over a large extent of surface. When the female is placed in such a manner as to remove the pressure of the gravid uterus upon the arteries, as upon her knees and elbows, this sound cannot be heard; and there are cases in which it cannot be detected, although the motions of the fetus may be distinctly felt. It is first heard about the fourth or fifth month of pregnancy, though some writers profess to have observed it even before the end of the third month, and becomes more audible as gestation advances. This is neither a constant, nor a positive sign of pregnancy, for it may be owing to various other causes, as aneurism, abdominal tumors, or whatever may compress the arteries, and has been heard even after delivery; hence, but little confidence is bestowed upon it at the present day.

The *sound of the fetal heart*, differs entirely from the placental souffle; it closely resembles the ticking of a watch, and differs materially from the mother's pulse in frequency and rapidity, beating from one hundred and twenty to one hundred and forty in a minute, the pulsations being sometimes so rapid as to render it impossible to count them, but returning to their natural character, without any cognizable cause.

The pulsations of the fetal heart are first perceptible between the fourth and fifth months, and are more commonly heard on the anterior inferior portion of the abdominal wall, just above the iliac fossa, occasionally on the median line, and over an extent of two or three inches; as the fetus advances in growth the pulsations become more marked.

These pulsations, whenever they can be heard, afford positive evidence of pregnancy, yet their absence is no indication of non-pregnancy, as the fetus may be dead, very feeble, or it may be in a position unfavorable to the transmission of sound to the ear; or an excessive quantity of the liquor amnii may destroy the sound. The presence of twins, and even the position of the child in the uterus has been attempted to be determined by the presence of these pulsations, but from the discordant and contradictory statements made by authors in relation to these points, no confidence can be placed in them; though if the sound of the fetal heart should be heard emanating from two points, it would be of some value in the diagnosis of twins. In auscultating a female suspected of pregnancy, especially during the fourth, fifth, or sixth months, it is advisable to have her lie upon her back, with the thighs flexed upon the abdomen; the bed should be of a hight sufficient to allow the practitioner to auscultate without stooping too much, which would render it impossible for him to hear any internal sound. The stethoscope, and not the ear, should be applied to the abdomen, which is less disagreeable to females, and it should be placed, first, over the part where the pulsations are most commonly heard, and then changed as may be required.

The *tangible signs*, or those which are ascertained by the touch, are exceedingly important in assisting us in our diagnosis of pregnancy, for by them we are not only enabled to determine this condition, but also its degree of advancement; hence, every practitioner should fully qualify himself to perform this operation of touching or manual examinat

The examination per vaginam or vaginal touch, is usu
means of the index finger, which is always preferable t
finger, as recommended by some writers; occasionall

become necessary to introduce both the index and middle fingers at the same time; this, however, is usually done for the purpose of reaching more deeply into the vagina, and the touching should be accomplished with the index finger alone, for if both are employed, there may be a double perception, and an uncertain, confused idea of the condition of the parts under examination. The practitioner should be able to manipulate with either hand, as occasion may require, and should be very careful that his finger nails are not too long or pointed, in order to avoid giving pain or injury, as well as to render the touch more easy, delicate, and certain; long finger nails, in an accoucheur, manifest negligence and carelessness, and are always inexcusable. The finger, in order to admit of its easy introduction, should be anointed with oil, lard, pomatum, butter etc., and not with mucilaginous liquids, as advised by many, because these last do not adhere so firmly to the skin, and are less apt to protect the finger, especially if there be excoriation of it, from the absorption of any infectious virus which may be present. As to the length of the finger necessary to become an expert accoucheur, that is of little consequence, as the shortest fingers and smallest hands become as perfect in this art, as the longer and larger.

The female may be placed in the erect, recumbent, or sitting posture, according to circumstances; thus, for *ballottement*, or for the detection of uterine displacements, the erect position should be assumed; to ascertain the advance of pregnancy, the size of the uterus, tumors, etc., the recumbent position is the best, with the female lying upon her back or side; the latter is preferable in these cases, with the head and chest elevated and inclined forward, and the inferior extremities separated and flexed as much as possible on the abdomen, so as to relax the abdominal muscles, and consequently render the examination more easy. In some instances where the erect position cannot be maintained, or where the recumbent would give rise to suffocation, as in debility, dropsy, dyspnœa, etc., the sitting posture will be found the best, in which the patient is so placed upon a chair that the weight of the body rests upon the sacrum, the body being inclined backward and the vulva being beyond the edge of the chair, so as to allow the operation to be performed. If the patient be standing, the physician should place himself in front, resting on that knee opposite to the operating hand, with the other knee, demiflexed, and placed between the limbs of the female, to act as a support for the elbow to lean upon, thus preventing the hand from trembling, and allowing the examination to be made more easily. If she is in the recumbent position, he will place himself on that side of his patient corresponding with the hand he intends to employ, and should be seated on a chair of a suitable hight. The woman, in whatever position she may be placed, must not be exposed, but have a proper covering over her.

The extended hand of the operator is now to be passed lightly and quickly along the internal surface of the thigh nearest to him if she lies on her back, or of the lower one if she lies on her side, toward the nates, and as soon as it is arrested by the soft parts, and the fissure between the nates recognized by the index finger, this must then be carried forward toward the vulva. Some writers advise the finger to be carried to the symphysis pubis and then moved downward and backward; but in doing this, friction against the clitoris and meatus urinarius must necessarily ensue, but which should always be carefully avoided. The practitioner must be careful not to commit an error by introducing the finger within the rectum, instead of within the vagina, indeed, this could only happen from inattention, or an inexcusable carelessness. On finding the vaginal opening, the condition of the external labia, its size and firmness must be ascertained by passing them between the thumb and index finger, and the fourchette may also be detected if there has been no previous labor, but if there has been, it will be absent, and its place supplied with inequalities. The finger is then to be pressed nearly backward with its palmar surface directed toward the symphysis pubis, examining, as it passes along the urethral canal, which is generally more swollen in pregnant women than others, the condition of the mucous membrane of the vagina, whether smooth or wrinkled, whether any abnormal conditions of its walls are present, and the width and length of the vaginal canal.

When about one-third of the finger has passed into the vagina, the wrist is to be strongly depressed, and the finger directed nearly vertical, when the *bas fond* of the bladder, the vaginal cul-de-sac, and cervix uteri may be examined. At this time of the operation the thumb is to be extended and applied against the anterior face of the symphysis pubis; the other three fingers will vary in position according to circumstances, being generally extended on the perineum, pressing it upward, and sometimes flexed with the thumb, into the palm of the hand, for the purpose of ballottement, or examining the parts on the anterior plane.

However, if the female lies upon her side, with her back toward the practitioner, the positions of the fingers will be nearly reversed, the palmar surface of the index will be looking toward the sacrum, and the other fingers and thumb more or less flexed in the palm.

The same method of introducing the finger may be pursued for the detection of malformations of the pelvis, the dilatation of the os uteri, the presentation of the fetus, etc. The various changes which the neck of the uterus undergoes during pregnancy, will be described in the following chapter, to which the reader is referred.

Abdominal palpation or *exploration*, may assist us in forming a correct diagnosis of pregnancy, and can be practiced in all cases, with a few rare exceptions, which may be owing to an excessive thickness of the abdominal walls. In making this examination the female must be placed in a recumbent position, on her back, with the hips elevated, the head flexed on the chest, and the thighs on the abdomen, which position completely relaxes the muscles of the abdomen. At first, both hands are to be applied over the abdomen, to determine its size, form, and hardness, more especially in the hypogastric region.

To ascertain the growth of the uterus, the practitioner will place the ends of the eight fingers immediately above the symphysis pubis, and make pressure until they feel the resistance of the uterine globe, and in this manner he will continue to ascend gradually until the fundus is gained, which may be known by the absence of any further resistance, and by the fingers sinking deeper and gliding over the convexity of the fundus. If pain should accompany the examination, or the abdominal muscles be in a state of great tension, further procedure must be postponed until a more favorable occasion. The uterine globe invariably retains its oval form, is circumscribed, presenting a resistance somewhat of an elastic character, and which is firmer in the early months of gestation than during the latter; and the practitioner will often be enabled to recognize movable, irregular masses, and even the various parts of the fetus. The elastic character of the uterine parietes is not so appreciable when the enlargement of the organ is dependent upon chronic disease, and should it be owing to the presence of a mole within its cavity, it will be impossible to decide, unless at an advanced period, when the absence of the fetal movements, pulsations of the heart, and the fetal inequalities, may furnish grounds for such a supposition.

The vaginal touch is usually practiced at the same time with the abdominal exploration, especially in the earlier months of pregnancy. The finger, introduced within the vagina, is applied on the neck, or against that portion of the uterus between the neck and the symphysis, or between the neck and the sacrum, while the other hand is placed above the pubis, pressing firmly to recognize the uterine tumor. The womb being thus located between the finger within and the hand without, the degree of its enlargement may be ascertained, by instituting a comparison between it and the non-gravid organ. Again, the finger may elevate the uterus, which will be recognized by the hand, or the hand may depress the organ, which will be felt by the finger, and thus its condition and situation be determined. However, during the first three or four months there are no unequivocal signs of pregnancy, and the practitioner will often be mistaken should he depend on any of them at this time, yet he may, in nearly all instances, satisfy himself of the unimpregnated condition of the uterus.

Another mode of determining the presence of pregnancy, is from the passive movements of the fetus in utero, and which is called *ballottement;* these motions depend upon physical laws, and are entirely independent of the vitality and muscular strength of the fetus, as they are present whether it be dead or alive. As a certain size and weight of the fetus is required for ballottement, it can not be produced in the early months of gestation, or if it can, it is imperceptible. The sensation of ballottement is, according to most writers, analogous to that produced by striking a marble ball, which has been placed in a bladder full of water, or in a glass tube likewise filled with water suspended in a vertical position, with the lower end closed by a diaphragm of bladder or parchment. The blow is to be given with the palmar face of the finger applied just under the spot where the ball rests, striking from below upward, when the ball ascends in proportion to the force of the blow, and when this force is exhausted, it descends and falls back upon the finger which displaced it, communicating a shock to it, and which motion and sensation constitute ballottement.

To perform the ballottement, the female should be standing, with her shoulders placed against some solid body, as a wall, to cause a projection of the abdomen. The finger, properly oiled, is then to be introduced into the vagina as far as the neck, and should be applied anteriorly, on that portion of the uterus between the symphysis pubis and the projecting portion of the neck, at which point a smart blow is to be given, sufficiently strong to cause the fetus to ascend; the blow should be made from below upward, and from behind forward, which last may be effected by suddenly flexing the first phalanx as the shock is imparted. As the uterus is generally inclined forward with its long diameter corresponding somewhat with the axis of the superior strait, this last direction of the blow will be required to cause the fetus to ascend in the direction of the uterine long diameter, otherwise, it will merely be pushed against the posterior wall of the uterus, being displaced without ascension. At the time the blow is imparted, the operator should place his other hand upon the abdomen, over the fundus, to firmly fix the uterus in its position, and a short time after the shock has been communicated to the fetus, he will press upon the fundus from above downward, to hasten the descent, and thus increase the intensity of the sensation to be experienced by the finger within the vagina, which finger is to be held firmly and steadily against that portion of the uterus which has been struck, until it has received the shock of the descending fetus, or until a sufficient length of time has passed for that result. Ballottement is best obtained when the woman is in the erect position; yet, there may be cases in which, from inability to stand, the recumbent posture may be employed, when the operator will have to place the finger at various points both anterior and posterior to the vaginal projection of the cervix.

Ballottement may be effected at the fourth month of utero-gestation, though it is frequently absent during this as well as the fifth month; at the sixth or seventh month it is very distinct, and conveys a sensation similar to that of a solid ball inclosed in a fluid and falling upon the finger, as above described. As the fetus continues to grow, ballottement becomes less distinct, is hardly perceptible at the end of the eighth month, and is impossible in the latter weeks of pregnancy. During the early period of ballottement it may be advisable, in cases where accuracy is absolutely required, and in which it can not be recognized, to make several trials; as from the fact that the small size of the child allows it to easily change its position, this sign may be present one day, and be quite impossible to detect at another.

By many authors ballottement is considered as a pathognomonic symptom of pregnancy, being equally applicable to the dead or living fetus, and, indeed, we know of no other cause to produce it, than the actual presence of a child within the uterus. However, the practitioner should always ascertain that there is no displacement of the uterus which might create a mistake, as in anteversion, and also that the shock communicated to his finger is not from stone in the bladder; each of these conditions, has, heretofore, occasioned some difficulty in determining true ballottement.

From what has been stated, it will be observed, that in order to determine the condition of pregnancy with certainty, the practitioner will be obliged to procure a delay until the motions of the fetus and other signs are manifested with force and distinctness, and which usually will be at the fourth or fifth month; though, from feebleness of the fetus he may have to wait for a still longer period. In all difficult cases, the physician, when called upon, should never positively affirm the existence of pregnancy, until he has distinctly perceived the pulsations of the fetal heart, ballottement, and the changes in the condition of the uterus; in ordinary cases, an experienced practitioner can form a correct diagnosis from these last uterine changes, as described in Chapter XV; the rational signs afford but little evidence of any value or certainty.

Occasionally, the physician is called upon to determine the stage of pregnancy; this is often very difficult. However, reference should be had to the length of time which has elapsed since the last ovulation, the position of the fundus uteri, the condition of the cervix, ballottement, auscultation, and the time of quickening, if it have taken place, and from all which, an approximation to the period of gestation may be obtained. As to the sex of the fetus in utero, I know of no method of determining it. Neither is there any reliable mode of ascertaining the presence of twins.

CHAPTER XV.

CHANGES IN THE CONDITION OF THE UTERUS DURING PREGNANCY.

FROM the moment of conception the uterus gradually undergoes a series of changes, in volume, form, situation, and direction, a knowledge of all which is highly important to the accoucheur. These changes occur both in the neck, and in the body, each of which I will review individually.

CHANGES IN THE NECK OF THE UTERUS. As gestation proceeds the congestion and ramollissement of the substance of the cervix gradually advances, until finally the whole neck becomes softened. Toward the end of the *first month*, the lower or inferior portion of the cervix commences to undergo this change, which is principally confined to the mucous covering of the part, imparting to the finger a fungous softness, but through which deeper pressure will detect the firm consistency of the proper tissue. The softening always commences below and advances upward, gradually progressing, so that at the end of the *third month*, or commencement of the *fourth*, this modification extends into the substance of the lips, softening them through their whole thickness to the extent of a line and a half, and increasing as gestation progresses, until at the *sixth month* it embraces one-half of the vaginal projection of the neck. It continues to advance gradually upward during the last three months, until finally the whole cervix, together with the ring of the internal orifice becomes so softened, that at "term" it has occasioned, in the practice of the inexperienced physician, much difficulty in discriminating it from the vaginal walls.

This ramollissement of the neck is an important indication of pregnancy, being present at an early period, and is found in all females in whom the neck is in a normal condition; it likewise renders material assistance in determining the stage of pregnancy. But in the investigation of this last point, it must always be recollected that in females who have given birth to a number of children, the vaginal projection of the neck loses a considerable portion of its length, and consequently, if one half of this projection has been lost, the softening will not commence in the lower extremity of the remaining portion, until the period at which it would have ensued, were the neck of its original extent, or at a period proportioned to the amount of length which has been lost. Thus, in a woman who has given birth to eight or ten children, the neck will vary very much in the extent of its softening at the sixth month, when compared with that of a female at the same stage of gestation, who has borne only two or three children. In primiparæ, or women with their first child, this softening progresses more slowly than in multiparæ, or women who have previously had children.

Beside the softening of the neck, it undergoes other modifications. During the early months of pregnancy it becomes thicker, with an increase of its volume, more especially at its superior portion; it is also found at a lower point within the vagina, inclined a little to the left, with the os tincæ looking more toward the pubis, and, as a larger extent of it can now be felt and examined by the finger, it has given rise to an erroneous impression that its length was likewise increased. At the fifth month the cervix looks more toward the sacrum, and still a little to the left, becomes more elevated and is difficult to reach; this elevation of the neck gradually increases as pregnancy advances, rendering it more and more difficult to reach, and which has, probably, led to the mistaken views of several authors, that the cervix became gradually shortened from the fifth month until "term," at which period it was completely effaced. The fact is, however, that there is no shortening of the neck until the ramollissement has occupied its whole extent, rendering it yielding and incapable of resistance, which generally commences in the last fortnight of pregnancy, and during the last few days, both in primiparæ and multiparæ, its length diminishes very rapidly, resulting in its entire disappearance. As the neck ascends, looking backward and to the left, the fundus is nearly always carried forward and to the right.

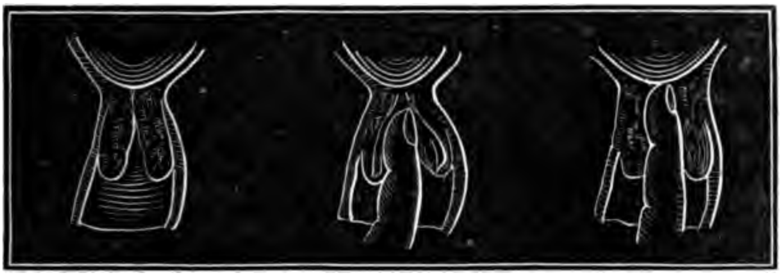
Perhaps, it would be proper to remark, that in primiparæ, toward the seventh month, there exists a slight diminution of the length of the cervix, but which does not materially affect the correctness of the above statement; this shortening is occasioned by the spindle shape assumed by the cervix at this period, or a bulging of its central part, which necessarily causes a slight approximation of the external and internal orifices of the neck. This does not happen in multiparæ.

The form of the cervix is different in primiparæ and multiparæ, during gestation. Among the former it will be found more pointed and contracted at its inferior extremity, and enlarged at its superior, and the os tincæ changes from a hardly perceptible transverse fissure, to one of a circular form, though it is seldom, if ever, opened, until dilatation occurs during labor. About the seventh month, the walls of the neck having become softened, they readily yield to the pressure of the secretions from their internal surface, and as the os tincæ remains closed, the central portion of the canal of the cervix is pressed outward, which gives to the whole neck a fusiform appearance. The external surface remains smooth and polished, and the os tincæ regular and rounded, without any roughness or inequalities; the circumference is sometimes soft, and occasionally, during the latter months, presents a sharp and thin border. Among multiparæ, the form of the cervix is quite different, somewhat resembling a thimble, with its small extremity upward, its orifice instead of being closed is opened sufficiently to admit the extremity of the finger, and its periphery is very irregular on account of numerous cicatrizations and fissures, the results of previous lacerations. As the softening advances upward, the opening of the os tincæ and inferior portion of the cavity of the neck simultaneously continues to increase, so that each month the finger may penetrate deeper into this thimble-shaped, and sometimes funnel-shaped cavity. Toward the ninth month, the second phalanx of the finger can be introduced within this opening, its free extremity being arrested by the closed and puckered ring at the internal orifice, which finally softens and dilates, allowing the finger to pass through the cavity of the neck, and to come in direct contact with the membranes. At this period the canal through which the finger passes, instead of being shortened, will be found to vary from one inch, to an inch and a half in length. (*Figs.* 25, 26, 27.)

The softening and spreading out of the neck is said to be greatly accelerated by frequent touchings or examinations during pregnancy, and occasionally the internal orifice opens at too early a period, even in the seventh month, especially among those women who are subject to floodings.

It is sometimes the case, that the presenting part of the fetus, in engaging in the excavation, presses the anterior inferior portion of the uterus before it, which, in a large pelvis, may even descend to the inferior floor, occasioning much embarrassment to the inexperienced practitioner, who not being able to ascertain the situation of the os tincæ, might erroneously suppose it to be imperforate. It will be readily seen that, as the portion of the uterus mentioned is pushed downward, the neck will be carried behind it, with the os tincæ looking toward the anterior face of the sacrum, and much difficulty may be experienced in gaining access to it; but when once reached, the finger must be bent like a hook and introduced into its cavity from behind directly forward, pulling the neck by its anterior lip down toward its normal location at the center of the cavity, while at the same time, efforts may be made with the other hand on the abdomen, or by means of an assistant, to elevate or push the body of the uterus upward and backward. While the womb remains in this mal-position, it will be impossible for delivery to be accomplished until the above change in its direction is effected; and when effected, if the female has been long in labor, with evident symptoms of dangerous exhaustion, the os uteri *soft* and *dilated* or *dilatable*, and *the head at the superior strait*, my own experience is in favor of at once terminating the labor by turning and delivering by the feet, at the same time administering sufficient stimuli to sustain the sinking powers of the system. This is the course I have adopted in three instances of similar character, and in each of which success crowned my efforts, with the exception of one child being still-born.

FIG. 25. FIG. 26. FIG. 27.



These Figures show the softening and opening of the cervix uteri, as pregnancy advances; also, how the finger ultimately gets into direct contact with the naked membranes.

PHYSICAL CHANGES IN THE BODY OF THE UTERUS, etc. In the non-gravid state, the uterus may be said to be in an inactive or dormant condition, from which it is suddenly aroused by conception, and becomes more susceptible, with increased temperature and swelling, from the greater sanguineous determination toward it. The *volume* of the uterine walls increases in every direction, and the uterine cavity enlarges, which enlargement is maintained by the new formation called the *caducous membrane*, and which is present long before the impregnated ovum reaches the uterine cavity. As soon as the ovule has reached the uterus, the increase of volume or development of the embryo, continues and progresses until the moment of parturition, being more rapid in the latter than in the early months.

The *shape* of the uterus is not materially changed during the first month of pregnancy, but subsequently, as its volume augments, from being flattened from before backward, it gradually grows rounder, assumes the shape of a pear, or gourd, then spheroidal, until toward the termination of gestation, it becomes of an ovoid form, slightly flattened in its antero-posterior diameter, with its anterior face more convex, and its posterior somewhat concave, to adapt itself to the projection of the lumbar vertebræ.

The *situation* of the uterus must necessarily vary in proportion to its increasing size and shape; thus, we find that during the first three months of pregnancy it is lower in the vagina, or pelvic cavity, with the os tincæ a little inclined to the left, and thrown forward to the pubis; but after this period it gradually rises from the excavation into the abdominal cavity, pushing the opposing contents of this cavity before it. From a knowledge of the various points at which the fundus is located, we may be enabled to determine the period of gestation; thus, at the *fourth* month, it will be found two or three fingers' breadth above the pubis; at the *fifth* month, it will be found within one finger's breadth of the umbilicus; the hypogastrium projects and is rounded, the vagina is elongated and narrowed, and the motions of the fetus are felt; the cervix is more elevated, is turned upwardly, and is more difficult to reach; from the fifth to the sixth month, the fundus passes the umbilicus, and, at the *sixth* month, is found half an inch above this depression, which now begins to project beyond the integuments; the vagina still further elongated and narrowed, with only a few projecting wrinkles at its lower portion; the cervix will be found nearly on a level with the superior strait, softer and larger than previously; ballottement is now readily effected; at the *seventh* month the fundus will be found three fingers' breadth above the umbilicus, with increased abdominal and umbilical projection, and often pain in the groins, from distension of the muscles of the abdomen; the neck is still further softened, more voluminous, and more difficult to distinguish; at the *eighth* month the fundus extends into the epigastric region, the abdomen is further distended, and the skin frequently cracks and presents livid marks or lines; the ramollissement, or softening of the cervix is still further advanced; during the *ninth* month, the fundus still continues to ascend, but in the last fortnight of gestation, there is an evident depression of the abdominal projection, the fundus is on a lower level than before; the respiration becomes more free, the woman more lively, and expresses herself as feeling lighter; the cervix is entirely effaced. This sensation of sinking of the womb, is, probably, owing to descent of the fetus, the head of which can usually, at this period, be readily felt, presenting a voluminous tumor within the pelvic excavation.

Although the above is the average of a number of observations, yet they are not invariable; as in many females, the shape and capacity of the pelvis and abdomen, and the resistance of the abdominal parietes, will affect, more or less, the rapidity and extension of these changes.

The *direction* of the uterus is altered by the changes which take place in the organ during pregnancy; while it remains within the excavation where it is supported by the pelvic bones, it holds its vertical direction, but as it passes upward into the cavity of the abdomen, where the soft parts alone sustain it, it inclines forward, following the direction of the axis of the superior strait, and which may be owing to the unyielding resistance of the lumbar prominence, and the yielding of the anterior abdominal wall; from the same cause it is made to lean toward one side of the abdomen, most commonly the right, forming the right lateral obliquity of the uterus. The reason of the greater frequency of this right obliquity, is, according to Mad. Boivin, that the round ligament of the right side is shorter, stronger, and more abundantly supplied with muscular fibers than the left; and as they draw the uterus toward the right, they necessarily cause this organ to rotate on its axis, carrying its anterior surface somewhat to the right side, and its posterior to the left; both of which changes are important to be understood.

The *thickness of the uterine parietes* has given rise to much contradictory speculation; some writers concluding, that in consequence of the great distension of the uterus, its walls become very much attenuated, while others consider that they become much thicker during pregnancy; but the fact is, that at the period of parturition, if an examination of the uterine parietes be made, they will be found to vary according to the portion examined, the neck being very thin, and the body and fundus of the same thickness as when in the non-gravid condition, with the exception of the part corresponding to the insertion of the placenta, which is thicker than at any other place. As there is, then, no diminution of the uterine walls during gestation, there must necessarily be a great augmentation of their bulk, which is ascertained to be the case, as at term, the uterus has been found to weigh two pounds; and in one instance, cited by M. Moreau, it reached nearly four pounds. In a few rare instances, the parietes of this organ have been found to be only a few lines in thickness.

The *density of the uterine parietes* likewise changes during gestation. In the non-gravid condition they are hard, resisting, and of a consistency approximating fibrous tissue, but in pregnancy they become softer and relaxed, which condition is present even at the first month, the walls having a softness which gives a sensation on pressure, similar to that of an œdematous limb, or of caoutchouc softened by boiling in water, and which is of some value in determining pregnancy. As the parturient period approaches, this ramollissement and yielding character of the walls continues to increase, so that the inequalities of the fetus may be felt through them, and its motions may not only be distinctly perceived, but will often produce a momentary projection of some part of the organ, and even of the abdominal parietes. In consequence of this suppleness of the uterine fibers, the fetus can change its position within the cavity of the organ during gestation, and thus cause its diameters to vary according to the position assumed, shortening its normal long diameter, and lengthening its short ones. The fetus is also protected from the evil results of blows upon the abdomen, or severe shocks received by the mother, which would ensue were the walls more dense and unyielding.

VITAL CHANGES IN THE UTERINE TISSUES. The most remarkable changes of the uterus, during pregnancy, are those effected in its texture, especially that of its *proper tissue*, or *middle coat*. This tissue, which, as I have heretofore remarked, is of a grayish color, dense, and composed of fibers of an obscure character in the non-gravid womb, in pregnancy manifests its true nature, changing from a state of density to one of softness and elasticity, extending its substance, enlarging, gradually assuming a reddish hue, having its fibers gradually unfolded, elongated, and presenting unequivocal evidence of its muscular nature.

Although the muscular character of the middle uterine coat has been determined, yet the arrangement of its fibers is still involved in uncertainty. Mad. Boivin, who has minutely examined the uterine structure, has probably given us the most correct account of the disposition of some of these fibers; still, there is much left to ascertain on this point. She states, that there is an exterior plane of fibers, running or radiating from the middle line, outward and downward, to the lower third of the womb; upon this part they terminate, and aid in forming the round ligaments located there, while the most superior ones are distributed to the Fallopian tubes, and the ovarian ligaments. There is also an internal plane of fibers, the arrangement of which varies considerably from the external, in being circular, and located at the uterine superior angles; having the internal orifice of the tubes as their center, they surround each of them, describing concentric circles, being very small and close toward their focus, but gradually separating as they advance from this point, so that the last and largest are found upon the median line, and extended in the direction of its length. Other muscular fibers are found between these two planes, but they cannot be traced. At the inferior part of the organ is a semicircular order of fibers, which commence at the median line of this region, and reunite on the sides near the round ligaments.

This structure of the uterus resembles that of all hollow organs, having longitudinal fibers externally, and circular and horizontal ones internally. The greatest development of muscular structure is found in the fundus, which is the part of the organ more especially concerned in the expulsion of its contents, and this structure is so disposed that, during contraction, the uterine surface approaches toward the center. The least resistance, during labor, should be made at the inferior part of the uterus, in which we find merely the horizontal fibers, forming an arrangement which will bear some comparison to a sphincter muscle.

Other anatomists have attempted to trace the uterine muscular fibers, and have separated them into layers, planes, and fasciculi; yet, notwithstanding all these attempts, there is so much irregularity and confusion in the course and arrangement of these fibers, so many crossings and intercrossings, and such an interweaving of them, that it is impossible to demonstrate them satisfactorily; we have presented to us only an inextricable muscular network, rendering the uterus fully capable of performing all its various movements of extension, contraction, dilatation, and shortening. M. Moreau observes, that "a skillful dissector may give the fibers any direction he chooses, without the possibility of proving the contrary."

That the longitudinal and horizontal fibers are separate and independent parts of the uterine structure, and probably all the other fibrous arrangements, may be inferred from the fact, that we often have one set of them powerfully acting, while, at the same time, the other is contracting with but slight force, or even not at all. Thus, in the hourglass contraction, we have an example of forcible contraction at one point, and a want of it at the two antipodal extremities. Again, not unfrequently there appears to be a want of action of those fibers which contract the organ in its longitudinal diameter, elongating the uterus to such an extent, that, as ascertained by an examination through the relaxed abdominal walls, after delivery, its length will be ten or eleven inches, with the fundus elevated toward the epigastrium, while its transverse diameter will be only three or four inches, resembling an intestine, rather than the womb.

A female during labor, as is often the case, may suffer intense pains, and make the most vigorous efforts, without any advance, whatever, of the child, although the pelvic formation is normal, and the uterus sufficiently dilated; may this not be owing to a want of simultaneous action of the two separate sets of fibers, the horizontal being active, while the longitudinal are slightly so, or altogether inert? This want of synchronism in the movements of the fibers, may be owing to irritation occasioned by protracted, or severe labor, by rheumatism, by the administration of ergot, or by officious intermeddlings, and which may also result from extreme susceptibility of the nervous system. In either case, to relieve this painful condition, a laxative injection should be administered, with the internal use of Opium, Morphia, Diaphoretic powder, or, still better, the compound pill of Black Cohosh [Ec. Dispensatory], which may be given, as often as the urgency of the symptoms indicate; the room must be freely ventilated, the drinks should be cool, and no examinations per vaginam must be instituted until the contractions become normal, and not then, without they are actually necessary. Occasionally, under these circumstances, and where there have been no previous violent contractions, in addition to the above treatment, I have found firm, but moderate pressure over the fundus to restore the energy of the inactive fibers.

The *serous*, or *external peritoneal coat* of the uterus, during pregnancy, extends in every direction, with a more active nutrition that prevents any diminution of its depth, there being but little difference in the thickness of this external covering, either in the gravid or non-gravid womb. The serous covering is movable on the tissue which unites it to the middle or muscular coat, this tissue being apparently diminished in density.

The *internal*, or *mucous coat* of the uterus, about which there have been so many discordant opinions, becomes very evident during pregnancy; it presents an increased and villous appearance, and from its great development its nutrition undoubtedly becomes more active. Its follicles become more marked, with an increase of their secretion. There are also glands found imbedded in the thickness of this coat, which appear to enter into the internal muscular layers; these enlarge after conception, and are viewed by some authors as the principal elements of the caducous membrane. These glands resemble small canals, and run tortuously within and behind the mucous uterine coat, forming a kind of knot, throwing out ramifications, and opening on the internal face of the inner mucous layer; they have been called the utricular glands.

The *bloodvessels* of the uterus likewise undergo changes which may be briefly noticed. In the unimpregnated condition the arteries are small, flexuous, and very much contracted, but during gestation, as they become less compressed by the uterine fibers, they expand, soften, and describe more regular curves; their caliber increases, the blood circulates more largely and rapidly, and a more active and energetic nutrition ensues. The arteries of the uterus, as heretofore stated, are furnished by the spermatics and hypogastrics, the superior portion of the uterus receiving chiefly the branches from the spermatics, and the body and cervix those only from the hypogastrics. The arteries are always tortuous, and when they arrive at the uterus, they do not run any distance under the peritoneum, but immediately enter into the muscular coat, pass toward the inner surface, and especially to the part where the placenta is attached, ramifying and anastomosing freely as they proceed; those branches which reach the lining membrane terminate in the tortuous canals in the placental decidua, while those which do not arrive at the inner surface ramify upon the coats of the veins. The veins of the uterus are greatly dilated, much more so than the arteries, and their points of communication with each other are multiplied to that degree, that at the parturient term, an inextricable mass of venous vessels is presented, giving to the uterine tissue a resemblance to that of the erectile. That part of the uterus to which the placenta is attached is more abundantly supplied with veins; and on removing the placenta the veins which open into the uterine cavity will be seen, presenting large, smooth-edged and oblique apertures. There are no proper valves to the veins, so that if any fluid be injected into the trunks of the spermatic and hypogastric veins, it will flow in a full stream into the cavity of the uterus, which may afford some explanation of the cause of the large quantity of blood discharged in so short a time from the uterus during parturition, together with that from the exposed arteries. The venous circulation in the uterus and placenta may be readily interrupted by the various derangements of function in the thoracic and abdominal viscera, and the removal of these obstructions during pregnancy is an important point.

The lymphatic vessels, or absorbents, likewise, become greatly enlarged during pregnancy; according to Cruikshank, the first who observed them, they are as large as a goosequill, and are so numerous, that when injected with mercury, they give to the uterus the appearance of a mass of lymphatic vessels. Those of the neck run into the pelvic ganglia, and those of the body into the lumbar ganglia. Cruikshank supposed their function to be that of carrying on a "copious absorption in the uterus toward the mother," during pregnancy; but Dr. Robert Lee has suggested another very probable function; he observes, "The sudden removal of the uterine structures after delivery, by absorption, is probably the most important office they perform, and the cause of their enlargement to such a vast size during the latter months of pregnancy."

The *nerves* of the uterus likewise become considerably developed during gestation, for the undoubted purpose of furnishing the uterus, during the parturient act, with all the nervous energy that may be necessary. After delivery, the nerves, together with all the augmented tissues and vessels of the uterus, return to their original size and condition.

CHANGES IN THE PROPERTIES OF THE UTERUS. In the unimpregnated condition, the vital properties of the uterus are very obscure, so that it may be touched, compressed, pricked, or even cauterized without causing pain or much uneasiness, unless it be morbidly affected; at this time its properties are chiefly limited to its tonic forces, or organic sensibility and insensible contractility, the separation of the principles of growth and nutrition from the circulating fluids, and the elimination of de-vitalized or decomposed elements which are no longer necessary to the maintenance of life.

It is true, that when the finger is brought into contact with the neck, the female is conscious of the touch; however, the sensation goes no farther; but during pregnancy the *animal sensibility* becomes much more marked, and the female more readily recognizes the contact of bodies with the neck, as well as the fetal movements, and which sensibility becomes more developed as gestation advances, so that in its latter stages even the touch becomes excessively painful with many women, and during parturition the uterine contractions produce intense agony. The introduction of the hand within the uterus, for the purpose of turning, effects similar pain, and when the adhering placenta is removed artifically, the woman experiences sensations as if she were being eviscerated. This exaltation of animal sensibility is principally confined to the neck, the body of the organ being nearly insensible; there exists, however, a relation between these two parts, from which irritations of the neck will influence the fibers of the body. And this relation will account for the premature births effected by repeated touchings, frequent coition, the irritations of the cervix from artificial dilatation, or the use of agents which stimulate the cerebro-spinal system. It occasionally happens, that the female will be unconscious of any movements of the fetus until the latter months of gestation, or even not until labor actually commences, owing to the slight development of sensibility, but in the majority of cases it is the very reverse of this.

The most remarkable property, however, which the uterus manifests during pregnancy is its *organic contractility*, which either did not previously exist, or if it did, it remained latent. This property, precisely resembles the contraction of a muscle, and is never manifested except under some irritating or stimulating influence; it varies in intensity in different females, and is so marked and energetic in many instances as to benumb the hand of the strongest man, when introduced to perform artificial delivery. It is this contractile power which effects the expulsion of the fetus and its secundines, as well as other productions which may be accidentally developed within the uterine cavity, and which, likewise, causes the womb, as well as its various vessels, to gradually return to the diminished condition in which they were previous to conception. Should the organic contractility of the uterus, from any cause, fail to manifest itself after parturition, a hemorrhage would ensue that would prove rapidly fatal to the parturient woman; and, when such cases occur in practice, the most important indication is to arouse this power of contraction, which is the natural remedy, and which produces its beneficial results by closing and obliterating the large open mouths of the bloodvessels on the internal placental surface of the organ.

In the human family the presence of these contractions is always accompanied with more or less pain, which is never found among animals in a state of nature, and which exists among savages and domesticated animals in only a minor degree. Accident or disease may, however, be the cause of pain with these last when in labor; and we have good reasons for believing that the excessive pains undergone by parturient females of our own race, are the results of the enervating influences of civilization and its various customs, habits, and refinements upon the constitution. In 1842, I was called upon to attend Mrs. D——, about twenty years of age, a short, thick-set female, brunette, and in apparent good health, with her first child; there had been observed a discharge of the waters, "the show," together with some singular and indescribable feelings, but no pain. From these symptoms, together with the calculations made upon the matter, it was presumed that labor could not be far distant; and it was, likewise, deemed expedient by the mother that the advice of a physician should be resorted to. Having ascertained that no pains of any kind had been experienced, I thought myself unwarranted in making any examination, but did so at the urgent request of the mother, when to my great astonishment I found the head within the pelvic cavity, and upon placing my hand upon the abdomen, I felt very distinctly the contractions of the uterus as they occurred, but the patient complained of no pain whatever. I now seated myself by the bedside to watch the progress of labor, as well as to be ready for any emergency in so singular a case, and the whole process of parturition was effected without any untoward accident, and without the least pain, if the asseverations of the female are to be believed; during the latter stage she evidently contracted the abdominal muscles and made bearing down efforts, not, she stated, from any painful influences, but from a strong sensation or desire to make them. Shortly previous to my visiting the West, I again attended this lady in her second labor, when she suffered as severe pains as I remember to have ever witnessed in the parturient chamber. The cause of this anomaly I do not pretend to understand; it has always been a matter of much wonderment to me, and I am not aware whether a similar circumstance is on record in the annals of midwifery.[*]

---

[*] In the course of some conversation with Prof. Powell, on medical subjects in general, I stated this case to him. He immediately asked me, whether she complained of pain, or soreness, at the junction of the neck with the cerebellum; which brought to my recollection the fact that she did; but, at that time I did not suspect that there was any connection between the uterus and the cerebellum, and therefore I was not sufficiently impressed with the importance of it, to investigate its particulars.

He locates an organ of Animal Sensibility immediately behind the mastoid process in the cerebellum, and in support of its existence and influence, he recited several interesting pathological cases, from which I select the following.

A boy had considerable pain and soreness in the right organ of Animal Sensibility; that is, he complained of pain in that part, and soreness of the soft parts, external to it. During his acquaintance with this boy, which was only a few months, he occasionally became paralytic as to sensation, on the left side; the skin could be cut or pinched, on that side, without his knowledge of it.

He stated another case, of a man who had an exceeding tenderness of the part indicated by the location of the organ of Animal Sensibility, with an exceedingly acute sensibility of the cutaneous surface of the opposite side; he could not bear the contact of his clothes upon it.

But a more important case to the practical wants of the profession, though it does not

The exercise of these organic contractions ensues involuntarily and without any dependence on the will, yet we sometimes find them influenced by mental impressions, so much so, that a violent emotion may arouse them at a premature period, and, it is not an uncommon circumstance for the appearance of the accoucheur in the room of the lying-in woman to cause a suspension of them for several hours, or even days. They may likewise be suspended for some hours, by the administration of opiates, as well as excited by stimulants, or irritation applied to the neck, or, ergot, strychnia, electricity, borax, and many other agents internally administered. If the uterus is excessively distended—if the labor has been too rapid, or prolonged, the contractions are very apt to diminish—become more slow and feeble—or entirely cease. I have met with instances, in which the contractions have been suspended for several hours, in consequence of an intoxicating draught of hot gin or brandy sling having been given by the nurse, to "ease the pains and give the woman strength."

These changes in the condition of the uterus, necessarily effect some modifications of the neighboring parts. In the early period of pregnancy as the uterus enlarges in the cavity, the vagina becomes shortened, but as soon as the former rises above the superior strait, the latter becomes narrower and longer; in its elevation the uterus carries its surrounding peritoneum along with it, the folds of which, or the broad ligaments disappear, and the tubes and ovaries approach nearer to the uterus, where they rest, nearly in a perpendicular position; the round ligaments present short linear fibers, among which are prolongations of the muscular fibers of the uterus, and which contract with that organ.

From the increased vitality of the reproductive organs, as well as from the obstruction of circulation by the enlarged uterus, the veins of the

---

directly illustrate the case before us, is the following. He was called to see a lady who had, two weeks previously, been delivered of her first child. In consequence of the number of persons present, and other circumstances, he could not ask her any private questions. Her complaint was a severe pain on the median line, or rather to the right of it, at the top of the neck, answering to the location which he assigns to the organ of Amativeness. She had no soreness in the part. He drew the conclusion, that the pain was symptomatic of a diseased condition of the left ovarium. The facts, as subsequently ascertained, proved his diagnosis to be correct. He added, that if she had complained of any soreness over the painful part, he would have concluded, that that portion of the cerebellum was diseased.

It is possible, in view of these facts, that the peculiarity of the case before us, may have been occasioned by some deranged condition of a portion of the cerebellum. This is the opinion of Prof. Powell, whose authority, on a question of this kind, is entitled to some attention.

vaginal walls become more developed, with various appearances, which are often recognized toward the termination of gestation, by the finger. The *vaginal pulse*, of Osiander, which he estimated highly as a diagnostic sign of pregnancy, may be felt, at some portion of the vagina, and is owing to the excessive enlargement of the vaginal and uterine arteries. About the seventh or eighth month, the vaginal mucous membrane is frequently covered with granulations the size of a pin's head, which not only line the whole extent of this canal, but also the exterior surface of the neck, and even the interior. When these are present there is an increased vaginal secretion.

One of the important changes to be understood by the practitioner, is that undergone by the bladder. This organ is gradually pressed above the superior strait, the urethral canal is elongated, and its orifice will be found behind the edge of the pubic symphysis, so that in introducing a catheter it must be directed nearly if not quite parallel with the pubic bone, with its concavity in front, and, in some instances, the curve of the canal becomes so great, from the bladder being pressed forward and above the pubis, that a male catheter will be introduced with more facility. This compression on the upper part of the canal, impedes the circulation in the lower parts, from which results tumefaction of its whole length. Tenesmus of the bladder is often the consequence of compression on the body and neck of this organ, occasioning frequent, urgent, and ineffectual efforts to urinate. In not a few instances the catheter will have to be used to relieve the irritated and distended bladder.

SYNOPSIS OF THE SIGNS OF PREGNANCY AT DIFFERENT STAGES.

During the First and Second Months.

RATIONAL SIGNS.

1. Suppression of the catamenial discharge.
2. Nausea, vomiting, ptyalism, anorexia, etc.
3. Unnatural flatness over the hypogastrium.
4. Tumefaction and tenderness of the mammæ.

SENSIBLE SIGNS.

1. Increase in the size and weight of the uterus, with slight prolapsus. The cervix uteri is directed to the left and toward the symphysis pubis.
2. Diminished mobility of the uterus, its walls soft like caoutchouc.
3. The os uteri round and regular in primiparæ, but in multiparæ, irregular in its circumference and more or less open.
4. Ramollissement and apparent œdema of the mucous membrane, covering the lips of the cervix uteri. The fibers of the neck not yet softened.

During the Third and Fourth Months.

RATIONAL SIGNS.

1. Suppression of the catamenia, (an occasional exception).
2. Continuance of nausea, vomiting, anorexia, ptyalism.
3. Slight prominence over the hypogastrium.
4. Depression of the umbilicus.
5. Tumefaction of the breasts increased, with prominence of the nipple, and a slight discoloration of the areolæ.
6. Kiesteine in the urine.

SENSIBLE SIGNS.

1. The fundus uteri elevated rather above the superior strait, at the end of the third month. At the termination of the fourth month, it rises two or two and a half inches above the pubis.
2. Fullness, and dullness on percussion over the hypogastrium.
3. Existence of a small tumor in the hypogastric region, detected by abdominal palpation, about the size of a child's head a year old.
4. The direction of the long diameter of the uterus is now changed, so as to correspond with the axis of the superior strait. At the fourth month the os uteri is considerably elevated in the excavation, looking backward and to the left.
5. Ramollissement of the inferior portion of the cervix is more marked; os uteri more open in the multiparæ, but still closed and rounded in those who have not borne children.

During the Fifth and Sixth Months.

1. Suppression of the catamenia. (Some rare exceptions.)
2. Cessation of nausea, vomiting, etc. now usually takes place, though they may continue throughout pregnancy.
3. Increased prominence of the sub-umbilical region.
4. The size of the abdominal tumor is increased, it is round, elastic, and if the abdominal walls be thin, the inequalities of the fetus may be felt.
5. The umbilical depression nearly effaced.
6. Discoloration of the areolæ more marked, with an enlargement of the subcutaneous glands.
7. Kiesteine in the urine.

1. At the end of the fifth month, the fundus uteri is within an inch of the umbilicus, and the same distance above it at the sixth.
2. Movement of the fetus is now active.
3. The bruit de souffle and the fetal pulsations may now be distinguished.
4. Ballottement.
5. Between the cervix and the pubis a tumor may now be felt, either soft and fluctuating, or round, hard, and resisting.
6. Ramollissement of the inferior half of the cervix uteri.
7. In the primiparæ, the os uteri is still closed, but in the multiparæ, it is sufficiently open to admit the half of the first phalangeal bone, although in each it is softened to the same extent.

During the Seventh and Eighth Months.

1. Suppression of the catamenia.
2. Nausea, vomiting, etc., ordinarily absent.

1. Increased size of the abdomen.
2. The fundus uteri, at the end of the seventh month, has risen two and a half

RATIONAL SIGNS.	SENSIBLE SIGNS.
3. Abdominal tumor much increased in size. 4. Dilatation of the umbilical ring, and pouting of the navel. 5. Increased discoloration of the areolæ, with enlargement of the sebaceous follicles, and increased prominence of the nipple. The milk may be pressed from the swollen mammæ. 6. Discolorations on the skin of the abdomen. 7. Vaginal-granulations. 8. Kiesteine still exists in the urine.	inches above the umbilicus; at the eighth, it is placed within the epigastric region; uterus commonly inclined to the right. 3. Movements of the fetus become more violent. 4. The fetal pulsations and the bruit de souffle still continue. 5. Ballottement perfectly felt during the seventh month, but becomes obscure in the subsequent months of pregnancy, on account of the increase in the size of the fetus. 6. The ramollissement of the cervix is more extensive, and at the end of the eighth month is nearly complete. 7. In the primiparæ, the cervix is ovoid and somewhat shortened; the os uteri is still closed. 8. In the multiparæ, the os uteri is conoidal and wide enough open to admit the whole of the first phalangeal bone; the superior fourth of the neck still hard and firmly closed.

During the First Half of the Ninth Month.

1. Reappearance of vomiting, not from nausea but from pressure of the gravid uterus against the stomach. 2. The abdominal tumor is increased in size; skin much stretched and tense. 3. Respiration difficult. 4. All the other symptoms remain and are augmented in intensity.	1. The fundus uteri occupies the epigastric region. 2. The movements of the fetus; the pulsation of the fetal heart and bruit de souffle are still present. At this time ballottement has disappeared. 3. The whole cervix uteri is softened, except the internal orifice, which remains firm and closed. The os uteri in primiparæ is slightly opened, though not sufficiently to admit the finger, as is the case in multiparæ, although the softening is equally extensive in each.

During the Last Half of the Ninth Month.

1. The vomiting ceases, as the abdominal tumor sinks from the epigastrium. 2. Respiration less oppressed. 3. Considerable difficulty exists in walking, owing to the sinking of the presenting part into the pelvic excavation. 4. Constant and ineffectual desire to evacuate the bladder and rectum. 5. The hemorrhoids, the œdema of the	1. The fundus uteri has sunk low down in the abdomen. 2. The sensible signs still persist, except ballottement, which is usually, though not always, absent after the fetus has acquired considerable size. 3. In multiparæ, the internal orifice of the cervix is softened and dilated, so that the membranes may be felt. In the primi-

RATIONAL SIGNS.	SENSIBLE SIGNS.
limbs and the varicose condition of the veins of the inferior extremities are all increased. 6. Pains in the loins, and colics.	paræ, the internal orifice is soft and dilated, but the external remains partially closed. During the last ten or twelve days, owing to the dilatation of the internal orifice of the cervix uteri, the whole cavity of the neck becomes enlarged, so as to increase the size of the uterine cavity; so that in *touching*, the finger reaches the membranes, in the primiparæ, after having passed the thin and even margin of the os uteri. While in the multiparæ, this margin is thick and unequal.

CHAPTER XVI.

COMPOUND, AND MIXED PREGNANCY.

COMPOUND or multiple pregnancy, are the terms applied to those pregnancies in which more than one fetus exists within the uterus at the same time. The cause of this peculiar disposition with some women to compound pregnancies, is a matter of mere conjecture, and but little is known relative to it which is either satisfactory or worthy of confidence. It has been attributed to the impregnation of two or more Graafian vesicles during a fruitful embrace, and which may happen either in one or both ovaries; again, and with some degree of probability, it is stated that one vesicle may contain two or more ovules, each of which becomes fecundated upon the rupture of the vesicle during copulation. By some physiologists it has been supposed that this anomaly is not the result of one act of impregnation but of two or more, and this is undoubtedly true in many instances, as examples are on record of females having given birth to twins, one being white and the other colored, the result of intercourse successively with a white man and a negro. And previous to the secretion of the mucus which fills the canal of the cervix during gestation, or to the appearance of the coagulable lymph which eventuates in the membrana decidua, superfetation may be possible.

Cases of a marvelous and probably fabulous character, are recorded where women have given birth to five, six, and even nine children at one birth, but it is rarely the case that more than two are present during pregnancy. In the course of a practice of twenty-one years, I have met with but two cases of triplets, and one in which a woman had four children at one birth, all closely resembling each other; while of twins or couplets I have met with quite a number, averaging about one in every eighty labors. From the want of sufficient vital force bestowed upon them, triplets seldom attain adult age, and twins rarely attain the meridian period of manhood.

As a general thing, in compound pregnancies, each fetus or embryo is surrounded by its own proper membranes, the chorion and amnion, so that the children do not come in contact with each other; but have between them four layers or laminæ, the two amnios, and the two chorions which touch each other. Sometimes, one chorion incloses both ovules, each, however, being enveloped with its proper amnion, and in which case there are but two layers or laminæ separating them, the two amnios, which rest against each other. Occasionally, the fetuses are all inclosed in one amniotic cavity; and very rarely, one fetus is contained within the body of another.

In the first-mentioned variety, should the placentas be united, there will be no vascular communication between them; and should one child die while within the uterus, it will not necessarily involve the life of the other; this will frequently be found to occur in twin and triplet pregnancies. The same labor may expel both children, or, if permitted, one child may be born two or three days earlier than its brother.

In the second variety, the chorion being common to each, there will be two cords and but one placenta, and as in the first, one fetus may continue to live independent of the death of the other. In this variety the birth of the two children must take place during one labor, the one being immediately expelled after the other.

In the third variety, one placenta will be common to each, with two cords, which sometimes extend to the placenta, and at others bifurcate from one common trunk at various distances from the placenta. In these cases, we often meet with monstrosities or imperfectly-formed children. The birth of the children must take place in this as in the second variety, during one labor; and possibly, the death of one may endanger the life of the other.

In the last form, monstrosity is the result. One fetus may be inclosed in the abdominal cavity of the other, which is termed *profound*, or *abdominal inclusion;* or, it may be merely surrounded by the integuments of the other, forming an external tumor having no communication with its internal cavities, which is termed the *cutaneous* or *exterior inclusion*.

There are no positive signs by which we can indicate the existence of twin pregnancy, although some have been noticed by writers. Thus, an unusual development of the uterus—but this may be owing to an increase of the liquor amnii; a flattening or longitudinal depression of the abdomen on the median line, in connection with the above, might justly give rise to a suspicion of twins, but this could only happen when the fetuses lie one upon each side of the uterus; two distinct shocks or motions, are sometimes felt at the same time in different parts of the uterus, but no reliance can be placed upon this as a sign; again, ballottement is exceedingly difficult in compound pregnancies, as one child must necessarily interfere with the ascent of the other. Auscultation has been named as a mode of detecting twin pregnancies, but we may err even in this, as the sound of the fetal heart can often be distinctly heard in distant parts, Cazeaux says, "Whenever the pulsations are heard at two distant points, the line between these should be carefully sounded with the instrument; for if they are produced by the presence of two fetuses, the pulsations will become feeble, or almost disappear toward the center of this line; but if, on the contrary, they are due to a single child, they will be just as strong at its middle part as at either extremity." However, it is of little importance to determine the presence of more than one fetus within the uterus during gestation, as a knowledge of it could be of no utility whatever, until parturition had taken place, at which time it can readily be detected.

Compound pregnancy, in consequence of the excessive development of the uterus, frequently induces labor previous to full term, and it is not uncommon in these instances to find the uterus contracting and expelling its contents during the seventh and eighth months of utero-gestation.

In addition to the above there are, 1st, *false pregnancies*, improperly so called, in which the uterus contains a false germ, mole, or hydatids; and 2d, *mixed pregnancies*, where the uterus contains both a fetus and mole.

Moles and hydatid formations, are undoubtedly the results of some diseased condition of the ovum, by which it becomes destroyed, or metamorphosed, into a growth possessing sufficient vitality to exist and augment in size, until removed by the uterine contractions. It is a true conception at first, but which becomes blighted by disease, and degenerates into a morbid development. These false pregnancies are extremely difficult to detect. When the uterus increases in size with greater rapidity than is natural under ordinary causes, with nausea, or vomiting, great constitutional irritability, occasional attacks of uterine hemorrhage, emaciation, quick pulse, etc., we may be led to suspect the presence of hydatids; and upon a vaginal examination, if we find a soft mass in the cervix, which upon being roughly pressed, bleeds, and discharges upon the finger portions of aqueous vesicles, our suspicion becomes certainty. Under these circumstances we must endeavor to promote an early expulsion of them. The index finger may be passed within the os uteri sufficiently far to reach the mass and break it in pieces; as soon as the contractions of the uterus have removed the detached pieces, we must examine again to ascertain whether any portion remains, and if any are found, they must be again broken, and thus proceed till the whole mass is discharged. If the finger can not be readily introduced for the above purpose, a sponge-tent may be placed in the canal of the cervix for the purpose of inducing uterine contractions, or ergot may be administered.

Hemorrhage to an alarming extent often accompanies a labor for the expulsion of hydatids, for which, in the early months, the tampon may be employed, together with other means for arresting uterine hemorrhage referred to under the head of abortion.

Mixed pregnancies are likewise very difficult to distinguish, and are almost always a cause of abortion, at which time, the practitioner must be watchful of the hemorrhage which may ensue.

When the ovule becomes impregnated within the ovary, it is seized upon by the fimbriated extremity of the Fallopian tube, through the canal of which it passes until it enters the cavity of the uterus, in which it becomes gradually and fully developed. Many writers believe that fecundation takes place only within the uterus, but the existence of extra-uterine pregnancies proves that conception may ensue in the ovary itself; and the idea advanced by some that the ovule after impregnation may make a retrograde movement from the uterine cavity through the tubes to the ovary or abdomen, is both absurd and opposed to reason. Undoubtedly conception may take place in the ovary, tubes, or within the uterus, whenever the male semen comes in contact with the matured ovum at any of its various points of discharge. However, let conception occur where it may, it is occasionally found that the ovum does not reach the uterine cavity, but is arrested or diverted from its route, and attaches itself upon some unnatural point, from which it proceeds toward a partial development; these instances are termed *abnormal*, or *extra-uterine pregnancies*.

The causes of extra-uterine pregnancy are involved in much obscurity; in some instances there have been found partial or complete obliteration of the canal of the tubes, either at some particular point, or throughout their whole extent, but the occasion of these closures or their period of occurrence, is not satisfactorily explained. Blows upon the hypogastrium soon after conception, have been named among the causes, though there is no certainty in relation to the subject, which is still one of inquiry. Cases are recorded in which fecundation took place, although the tubal canals were imperforate throughout, and many others where it has occurred, without a rupture of the hymen, so that notwithstanding what has been advanced in relation to the matter of impregnation, much yet remains for investigation.

We may be led to suspect the presence of extra-uterine pregnancy, when we discover a premature enlargement of the abdomen above the symphysis pubis—when this enlargement is less uniformly developed, and more irregular in its shape, than in normal pregnancies—when the tumor or enlargement is found in one of the iliac fossa, being easily felt through the parietes of the abdomen—and when upon a vaginal examination, the uterus is found not to have increased in size, nor undergone any change from a firm, unyielding tissue, to one softened and elastic; and very often this organ will be found pressed by the abnormal tumor against some part of the pelvic walls. Pain is generally present, especially when the motions of the fetus can be felt, and which gradually becomes more severe as its development proceeds. The pain is somewhat similar to uterine pains, and at times it is constant, fixed, and circumscribed in the pelvis, groin, or umbilical region. Generally, during the earlier period of abnormal gestation, it is very difficult to ascertain its existence. While it exists, some of the symptoms of pregnancy, as cessation of menstruation, nausea, vomiting, mammary enlargement, etc., may be present, but in many instances these have been absent. There is a discordance of opinions among writers, relative to the *membrana decidua*, some of whom assert that the internal surface of the uterine cavity becomes covered with it, during extra uterine pregnancy, while others deny it; among the latter may be named Dr. Robert Lee, of London. But the statements of M. Cazeaux, Prof. Meigs, Ramsbotham, and other investigators, tend to prove conclusively, that the *membrana decidua* is formed within the uterine cavity in abnormal pregnancies. Ramsbotham remarks, "It is a curious circumstance in the history of these cases, that if the child should live until the term of gestation is completed, as soon as that time has expired, the uterus takes on itself expulsive action, which is attended with pain similar to the throes of labor, and during these pains the deciduous membrane is expelled from the cavity, with a slight sanguineous discharge; the same also occurs on the death of the ovum, provided that be premature." In these pregnancies we will frequently discover an increase of the uterine volume, with ramollissement, especially during the early stages, and will sometimes find a thick, ropy, gelatinous substance or mucus in the uterine neck.

The duration of abnormal pregnancy is very variable; most commonly it terminates in a few weeks or months; seldom exceeding five months; and occasionally it has continued through a series of years, even as long as forty-six years. It is stated, that in those cases, where it has continued during the full period of labor, there have been at the termination of the ninth month, symptoms simulating labor, as intermittent pains more or less severe in character, a commencement of dilatation of the os uteri, a discharge of muco-sanguineous fluid, and true uterine contractions; and where this condition has continued for several years, these phenomena have recurred at fixed or irregular periods—but they are by no means constant.

The most common termination of extra-uterine pregnancy, is by a rupture of the cyst which incloses the fetus, and which may be effected by a blow, violent exertion, or some similar cause, or it may ensue slowly and gradually. This rupture is accompanied with several symptoms of a grave nature; at first, there will be severe pain for several hours, and finally an agonizing pain will be followed by tranquillity and a perfect quiet from suffering, with a subsidence or flattening of the abdominal enlargement, or, perhaps, its entire disappearance; the abdominal cavity experiences an increased heat, and the patient, if the development was of some months' date, will feel as if a voluminous body had been displaced; the skin grows pale, faintings come on, the pulse becomes small and contracted, a cold sweat covers the whole body, and frequently death follows, owing to the hemorrhage produced by the rupture of the cyst. Or, if hemorrhage to a copious extent should not ensue, or it should be arrested, violent peritoneal inflammation will be the result. The fetus in all these cases is usually dead, which may have been the result of defective nutrition or some cause unknown; and if a new cyst is formed, which is sometimes the case, although very dangerous to the mother, it is more favorable, because it may probably form an abscess from which the fetus may be discharged, and thus save the patient's life, or, it may permanently hold the fetus while this undergoes several alterations, as hardening, or passing into the state of adipocire, all the fluid parts being absorbed, and the cyst becoming gradually a solid, non-malignant tumor. Again, it may terminate in a sac containing pus, in which the fetus putrefies, and is eventually discharged into the peritoneal cavity, the intestine, or bladder, and which may give rise [illegible] or it may become coated with a bony, earthy, or semi-coriaceous crust, and remain comparatively harmless; producing no distress, except that occasioned by its weight and bulk.

Extra-uterine pregnancies have been divided into several varieties, each variety being determined by the point of fixation of the ovule, thus:

1. *Ovarian Pregnancy*, is that in which the ovum remains adherent to the surface of the ovary, and is of two kinds—where the ovule is found within the vesicle which held it previous to conception, and where it is partly developed in the abdomen, and partly in the substance of the ovary itself. It may continue for five or six months, when, from the augmented size of the fetus, the cyst ruptures during a paroxysm of pain, and, as found after death, the fetus, with a large amount of blood is expelled into the abdominal cavity. During the presence of this abnormal pregnancy, most excruciating pain about the pelvis, is experienced by the patient from time to time, with constipation and dysuria; and an examination of the uterus per vaginam, detects it unaltered in size, form and consistence. The pain is not constant, but regularly or irregularly intermittent, with intervals of ease. But after the rupture of the cyst, the pain becomes more severe, with syncope and finally death from peritoneal inflammation. The existence of this form of extra-uterine pregnancy, is denied by some authors.

2. *Tubar*, or *Tubal Pregnancy*, is probably the most frequent variety of extra-uterine pregnancy. An arrest of the ovule takes place in some portion of the Fallopian tube, between its fimbriated extremity and its uterine orifice, and at which point the placenta becomes attached to the inner face of the tubal canal, the walls of the tubes forming the fetal sac. The growth and development of the fetus proceeds for two, three, or four months, when the sac ruptures. In this form of abnormal pregnancy, there is an early enlargement over the symphysis pubis, and a vaginal examination will find the uterus unchanged in size, etc., and movable, but unconnected with the mobility of the tumor. As the fetus continues to grow, the female suffers severe pain in the pelvis, which is increased after the rupture of the sac, and is followed by excessive prostration and death. The fetus is most commonly discharged into the abdominal cavity.

3. In *Ventral*, or *Abdominal Pregnancy*, the impregnated ovule fails to reach the tube and falls into the abdomen, upon some portion of the walls of which the placenta attaches itself. The pain, experienced by the female in this variety of pregnancy, is situated in the abdomen; the enlargement is found in the iliac fossa, at an early period; upon an examination per vaginam, the uterus, as in the previous species, is found unaltered, and more movable than in any other of the abnormal

pregnancies; and the fetal movements may sometimes be observed till the ninth month. The sac, which incloses the fetus, gradually forms adhesions with the surrounding parts, and inflammation most generally occurs, at some period, followed by abscess, which discharges the fetus through the walls of the abdomen, the rectum, or the bladder. Cases are reported in which the fetus has remained within the abdomen for forty and fifty years, and others in which normal pregnancy occurred during the presence of the first fetus in the cavity of the abdomen.

There are several other varieties named by authors, to which a brief reference may be made, as, *Sub-peritoneo-pelvic pregnancy*, in which the ovum is situated between the two laminæ of the broad ligament, where it becomes developed, and which is, probably, the least dangerous of any, as its situation favors the spontaneous expulsion of the fetal debris, and renders them more accessible, should their extraction become necessary; *Tubo-ovarian pregnancy*, in which the cyst surrounding the fetus is partly formed by the ovary, and partly by the opening of the dilated tube, whose extremities have contracted some adhesions with the ovarian tunic; *Tubo-abdominal pregnancy*, in which the cyst is partly made up by the walls of the tube, the placenta being attached to their interior face, while the other portion of the surface of the ovule is in the cavity of the abdomen, and in which cavity the fetus is usually developed; *Interstitial*, or *parietal pregnancy*, in which the ovule penetrates into the midst of the uterine fibers, the cyst being formed by these muscular fibers alone — how this is accomplished, is at present an enigma; *Utero-tubal pregnancy*, where the ovum is retained partly within the tubes, and partly within the uterine cavity; and, *Utero-tubo-abdominal pregnancy*, in which the fetus is in the abdominal cavity, the umbilical cord passing through the canal of the tube and into the uterus, to the inner face of which organ the placenta is attached.

In all these abnormal pregnancies, the ovule retains its proper membranes, as the chorion and amnion, by means of the first of which circulation is effected between the mother and embryo, and in those cases where inflammation has been produced by the presence of the ovum in the peritoneal cavity, a membranous cyst is formed somewhat similar to the caducous membrane of the uterus.

TREATMENT.—It is very difficult to determine extra-uterine pregnancy, in its early stage; our attention is seldom called to it until at an advanced period, and often only at the time when rupture of the cyst is about to ensue. And even could we ascertain it with certainty at an early period, it is very doubtful whether any positive means could be pursued to destroy the ovum, or check its further development. Perhaps hydragogues might answer the purpose, but this is merely a suggestive measure and one that requires trial and observation before it can be recommended with confidence. All that can be done in these cases, is to subdue pain, inflammation, and other symptoms, upon general principles, keeping the bowels, which are always constipated, in a soluble condition by laxatives or cathartics; indeed, when the strength of the patient will admit, I see no objection to a free use of cathartic medication at an early period of treatment. Attention must likewise be bestowed upon the bladder, having it evacuated naturally, or by catheterism, at least twice a day. When the strength of the patient fails, it must be supported by tonics, wines, cordials, and nutritious diet, especially when an abscess forms, with decomposition of the embryo; and the abscess should be opened as soon as the suppurative stage is present. At this time active catharsis must be avoided. As the bones present, they must be removed similar to other foreign bodies in the abdomen. Gastrotomy has occasionally been successful, in cases where the fetus had died previously, but from a review of statistics relative to this point, I believe the chances in favor of the mother's life are greater when the case is left to nature, and the accompanying symptoms treated upon general principles. Of course, in these cases, he must be a rash practitioner who would seek to save the life of the child, as such attempts have almost always proved fatal to the mother. If any portion of the fetus should be discharged into the bladder, the operation for stone may be performed; but we should always be certain of this fact before attempting the operation.

CHAPTER XVII.

DISEASES OF THE PREGNANT FEMALE.

BETWEEN the uterus, and every part of the body, a strong nervous sympathy exists, owing to the intimate relation maintained between the sympathetic and cerebro-spinal system of nerves; and this sympathy is more especially marked during the condition of pregnancy, when the ganglia and plexuses of nerves, together with the bloodvessels and absorbents of the uterus enlarge, and become roused from a state of apparent inertia to one of energetic activity. This change in the female system, gives rise to many symptoms, which may be considered as *indications* of the healthy act of conception, and which, as a general rule, should not be meddled with; but, when they become unusually severe or protracted, they are then termed the "diseases of pregnancy," and require proper treatment for their palliation or removal. As pregnant females are liable to the same diseases as the unimpregnated, it would require a volume to treat separately upon them; I shall, therefore, confine this part of the subject to those conditions more common during pregnancy.

When the female is supposed, from the presence of the ordinary symptoms, to have become pregnant, certain measures are necessary for her to pursue as well for her own benefit as for that of her offspring. All compression upon the abdomen or around the waist, such as stays, corsets, belts, etc., should be at once removed, and should not be resorted to until after parturition, if resorted to at all; an attention to this point may prevent abortion, varices, uterine or other diseases, on the part of the mother, which difficulties are very apt to be the result of pressure and consequent obstruction of the portal circulation, as well as of the great arterial trunks and veins of the abdomen; and on the part of the fetus, hydrocephalus, deformity, or positions which may render the labor tedious and even fatal. She should likewise, be especially observant of her diet, selecting that which is the most nutritious as well as most easily digested, bearing in mind, that the gastro-uterine sympathy, as well as the gradually increased volume of the uterus, tend greatly to diminish the energy of the digestive powers. Stimulants especially, as alcoholic, vinous, or malt liquors, fats, much acidulous food, and in instances where they prove decidedly hurtful, tea and coffee, are to be avoided. The use of farinaceous vegetables, ripe fruits, boiled or roasted meats, water, and milk, may be named as among the best kinds of food and drink; and, though many females may have indulged their appetites without any resulting unpleasant symptoms, yet such a course is more apt to produce various difficulties than is generally supposed, especially upon the future of the fetus. Moderate exercise in the open air, especially during the early months of pregnancy, should be very strongly advised, with only occasional and not too prolonged bathing. Coition, though commonly indulged in during pregnancy, is extremely unwise and improper; and though often practiced with impunity, yet it is very apt to be followed by metrorrhagia, abortion, or some defect in the mental or physical organization of the offspring. Females subject to leucorrhea, immoderate menstrual evacuations, abortions, as well as those of a nervous or impressible temperament should be particularly warned against cohabitation during pregnancy. The symptoms or diseases of pregnancy, which frequently require medical treatment, are first, those which are the result of deranged circulation and nervous sympathy; second, those originating from the compression of the enlarged uterus upon the neighboring organs; third, diseased conditions of the uterus or its contents; and fourth, accidental diseases.

Among those symptoms depending upon deranged circulation and nervous sympathy, one of the most common, as well as the earliest, is *vomiting*, or *morning sickness*, as it is more usually termed. With the major part of females it is the first sign of pregnancy, commencing usually about the fourth or sixth week, and sometimes immediately after conception, and continuing for a few months, or even up to the parturient period. The female experiences more or less nausea from the time of rising in the morning, which may at first be removed by eating the morning meal, but which soon becomes followed by vomiting of a greater or less degree of severity and duration; occasionally, the vomiting becomes exceedingly violent, everything being rejected from the stomach, and if not checked, the female may die from exhaustion or starvation; or premature labor may ensue, followed by hemorrhage of an alarming character. Where the vomiting occurs during the first three or four months of pregnancy it is dependent upon gastro-uterine sympathy — is principally confined to the morning, lasts from ten minutes to an hour or two, each day, and usually ceases in from two to four months; the matter evacuated is thick, slimy, colorless, greenish or blackish, frequently acid, and if the effort at vomiting be severe, a little bile or even blood may be mixed with it. This sympathetic vomiting seldom falls under the practitioner's care, unless it becomes very severe; and indeed, no especial means are required for its removal when not too violent or prolonged, as it is merely a normal effect of conception.

When the vomiting occurs only in the morning, and is comparatively slight, it may be palliated by some aromatic infusion, and if the discharges are very acid, magnesia, alkalies, with aromatics, or charcoal, will be found efficient; sometimes these agents will exert but little effect upon the acidity, in which cases, they will have to be laid aside and acids employed, as Lemon-juice and water, a solution of Tartaric or Citric acid, or acid wines. Should the discharges contain much bile, mild cholagogue laxatives will be found beneficial, as a combination of two parts of Rhubarb and one of Bicarbonate of Potassa, administered three times a day, in doses of eight or ten grains of the mixture, or sufficient to produce one or two mild alvine evacuations, daily; or Leptandrin may be given alone, or with a very small proportion of Podophyllin, Apocynin, or Magnesia. When the vomiting is accompanied with much pain in the stomach, opiates, Cypripedin, Lupulin, Scutellarin, with counter-irritation to the epigastric region, may be employed with advantage; and in severe and obstinate cases of pain, I have succeeded in giving relief, when other means had proved inutile, by applying a warm fomentation over the epigastrium, composed of Hops and Stramonium leaves.

When the vomiting is violent and obstinate, various means have been advised, all of which have at times proved beneficial; it must be remembered, that while a certain course may produce a good influence on one patient, it may have no effect, whatever, upon another, hence, the necessity of an acquaintance with these several means. As severe vomiting is frequently accompanied with gastric or hepatic derangement, it will be proper to resort occasionally to cholagogue laxatives, as before named, after which an infusion of Swamp Dogwood bark (*Cornus Sericea*), may be administered. I have employed this infusion in a great number of cases, accompanied with the application of a sinapism over the last dorsal vertebræ, with much benefit; the infusion may be drank freely through the day. An infusion of the bark of Ptelea trifoliata, has likewise been used advantageously in severe vomiting; and in several instances I have derived much benefit from a pill, composed of one and a half grains, each, of Caulophyllin and hydro-alcoholic extract of Cimicifuga; one pill for a dose, to be repeated three or four times a day. In cases where the circumstances of the patient will allow, Champagne wine, according to Prof. Meigs, taken during the meal (should vomiting occur after the meal), will almost always prevent it. I have occasionally met with severe cases of vomiting, in which, after the employment of the usual remedies without effect, Lobelia has produced the desired influence; in such cases, I have rubbed together one drop of Oil of Lobelia and thirty grains of Sugar, and given one sixth of the mixture for a dose, repeating it every ten or fifteen minutes until relief ensued, which generally followed the first or second dose, rarely requiring a third or fourth. Notwithstanding all these remedies, it will happen, sometimes, that no relief will be experienced, and the patient continues to suffer up to the fourth month without any amelioration of her condition; yet, even in such cases, the physician should not add to her suffering by giving up the case as beyond remedial action, but should cheer her up, and endeavor to fortify her spirits by the anticipation of better effects from the next means to be used. Among the other means which have been recommended for this distressing symptom, but which I have not had occasion to use, are Ice, Iced waters, Effervescent draughts, as Soda or Mineral water, Creosote, Turpentine, Seidlitz powders, Lime-water, infusion of Wild Cherry-tree bark or Peach leaf, and tincture of Nux Vomica. In all these cases, the diet should be of the lightest character, and if the stomach be found to possess less irritability at any certain period of the day, this period must be selected for taking the principal meal. The practitioner must likewise ascertain whether fluid or solid food agrees best with the stomach, and advise the patient accordingly. The patient should not move about too much, and, sometimes, rest in the horizontal position will be absolutely required. Gastritis, indigestible food, constipation, certain odors, etc., may likewise give rise to, or increase the severity of vomiting during utero-gestation, all of which should be borne in mind during treatment, that if present as existing causes, they may be removed.

Where vomiting occurs only during the early part of the day, Prof. Meigs recommends a cup of coffee with toast to be taken by the patient while in bed, after which she should, if possible, sleep again for a short time; upon subsequently arising no nausea or vomiting will take place.

The vomiting that occurs after the fourth month of pregnancy is owing to the pressure of the gravid uterus upon the stomach, and is often very difficult to relieve; indeed, palliation is all that can be expected. Tonics, and antispasmodics may be employed in these cases. I have frequently met with cases which resisted all treatment, ceasing only at parturition; and again, I have considerably mitigated the severity of this distressing symptom, by keeping the bowels in a regular condition, and administering small doses of Sulphates of Quinia and Morphia, or of Sulphate of Morphia and Caulophyllin, or Scutellarin, Sulphates of Quinia and Morphia, with counter-irritation over the last dorsal vertebræ. In this form of vomiting, all food, or whatever is received into the stomach is rejected, and the patient suffers from inanition; indeed, the principal subject of fear is, that she may die from actual starvation. It should be our aim to discover what variety of food best agrees with the stomach, and the period of the day in which this organ is the least irritable, that advantage may be taken of that period for taking a light meal. In some instances where vomiting followed the reception of everything taken into the stomach in even moderate quantity, I have succeeded in sustaining the powers of the patient up to the period of parturition, by giving half-teaspoonful, or teaspoonful doses of milk, cream, gruel, etc., every hour or two throughout the day, occasionally with a few drops of Brandy, or other stimulant added, accompanied with injections of Elm bark infusion, Port wine, and Laudanum, repeated two or three times a day, and occasionally changed for injections of gruel, starch-water, etc. In these cases, the less medicine the patient swallows, the better will it be for her, except when imperiously demanded.

Frequently the vomiting becomes so excessive as to threaten the life of the patient, as before observed, from starvation; for it is seldom the case that abortion is produced by puerperal nausea, though it frequently ensues from emetics. In such instances, after a fair and patient, but fruitless trial of all remedies to overcome the difficulty, and sustain the patient's strength, we may be compelled to resort to premature delivery. This, however, is not to be thought of, unless the patient's life is actually endangered, and should never be undertaken without having first consulted with one or more medical men. Dubois, who in the course of thirteen years met with twenty fatal cases, advises never to perform the operation, even though the vomiting be violent, when the patient, however feeble and emaciated she may be, is not obliged to retain her bed, when a small portion of aliment can be retained, and when intense and continuous febrile action has not been induced; he also prohibits the operation when signs of extreme exhaustion are present, as loss of vision, cephalalgia, coma, somnolence, and mental disorder. A timely interference is advised, at a period characterized by an incessant vomiting, whereby all food, and sometimes even a drop of water is rejected; where emaciation and debility are present, requiring absolute rest; where the least movement or mental emotion causes syncope; where the features become decidedly changed; where there is severe and continuous febrile action, with excessive and penetrating acidity of the breath, and a failure of all other means.

When vomiting has been very distressing during labor, I have frequently given prompt relief by the administration of the tincture of Gelseminum, and would suggest its employment in these obstinate vomitings during pregnancy.

Ptyalism, or *salivation*, frequently occurs during the early months of gestation, and seldom requires any treatment. Rarely, however, it becomes very severe, resembling mercurial ptyalism, but differing from this in the absence of tenderness of the gums and disagreeable fetor of the breath; the fluid secreted is colorless and transparent, or tenacious and frothy, with an unpleasant taste, commonly accompanied with acidity, and often inducing vomiting. As a general rule, this symptom needs no treatment, and indeed, treatment effects but very little benefit: the best plan is, to regulate the action of the bowels by mild aperients, and wash or gargle the mouth and throat with some astringent infusion, as of Golden Seal, Geranium, and Sumach bark. In cases of acidity, Lime-water may be used with some advantage. The secretion, when profuse, may be moderated, by constantly holding in the mouth some candied Sugar, or a lump of Gum Arabic.

Anorexia, or *a want of appetite*, and a dislike for ordinary aliments, are symptoms frequently met with at various stages of utero-gestation. These may be owing to the sympathetic actions existing between the uterus and digestive organs, to a torpid state of the organs subservient to digestion, or to an unloaded condition of the alimentary canal. Usually, puerperal anorexia requires but little attention; but where treatment is required, it must be based upon the supposed cause of it—thus, if it be suspected as a result of nervous sympathy, antispasmodics will generally remove it; if it originate from torpor of the digestive apparatus, mild aperients, with tonics will be found useful; and if it be induced by plethora, or an accumulation of morbid matter in the alimentary canal, mild purgatives will be essential. Indeed, I would remark here, that throughout the whole period of utero-gestation, if the bowels be kept in a soluble condition by mild aperients, or by the use of proper food, many of the distressing symptoms common to this period will be avoided. Flatulence may be removed by an infusion of Fennel seed, or other aromatic, or by compound spirits of Lavender given in some sweetened water. To overcome these difficulties, some authors recommend emetics, but I am decidedly opposed to their use: firstly, because milder measures will accomplish all that can be desired; and secondly, because emetics have a tendency to produce abortion, and which may be avoided by other efficient and less hazardous means. There are some practitioners who proceed, apparently, as if they supposed every patient's stomach to be a strong metallic vessel, capable of being acted upon by emetics, powerful stimulants, drastic purgatives, etc., etc., without the least injury whatever, but always with benefit; such physicians, of all men, are the least adapted to obstetric practice, and I might add, truly or any other.

Either with or without anorexia, the patient may have "longings," or a desire for certain articles, which are sometimes unnatural and even disgusting. When these longings are not directed to unwholesome or dangerous articles, there is no reason why they should not be indulged; neither is there any necessity for interfering with any particular dislikes which may have been produced in the patient's mind. In relation to these longings, and their influence upon the fetus in utero, when ungratified, as well as to the effects of the maternal mind, generally, upon it, there is much discordance of opinion among medical men, some believing that the embryo is acted upon by strong mental emotions of the mother, while others deride the idea. I must confess, that too much evidence, of a direct and satisfactory character, has been at various times presented to me, to permit me for a moment to doubt this point; and I am thoroughly convinced, that the fetus in utero is subject to influences and changes, resulting entirely from the mind of its mother, when under strong or continuous action. How, or why this is produced, is as difficult for me to explain, as it would be to account for the cessation of a severe labor-pain on the entrance of the accoucheur into the puerperal room, or the sudden dissipation of toothache upon obtaining a sight of the forceps, or to explain why one man should be actively purged upon seeing another swallow a nauseous dose of medicine. I know, "sympathy," and "imagination" are held up as replies — but if these are applicable to the latter cases, why not to the former? A greater attention to the effects of nature, as witnessed in the human system, and less attention to speculative hypothesis and dogmatic authority, would tend much to advance the true science of medicine. He who really desires a knowledge of the truth, will not hesitate to receive it from any source.

Diarrhea may occur and usually yields to the ordinary treatment for this disease, when independent of pregnancy. It may be owing to intestinal irritation, which may be the result of constipation preceding pregnancy, or it may be induced by the sympathy existing between the intestines and the excited uterus; under either of these circumstances, it would be proper to give our officinal compound Syrup of Rhubarb and Potassa, and to continue its use until it has thoroughly evacuated the bowels, after which, antispasmodic and mild astringent infusions should be administered. In some instances, Leptandrin, and Podophyllin will prove more efficacious than the above syrup. When the diarrhea depends upon chronic inflammation of the mucous membrane of the intestines, it becomes of a serious character, and unless treated promptly and properly, may terminate fatally. In this case, mucilaginous draughts, as infusion of Peach leaf and Marshmallow, or of Elm, and Wild Cherry, should be freely given—warm fomentations should be applied over the abdomen, and mustard to the dorsal and lumbar portions of the vertebral column; an enema, composed of Elm infusion, one fluidounce, tincture of Prickly-Ash berries, two fluidrachms, and Laudanum twenty or thirty drops, should be given immediately after each alvine discharge, or oftener should the symptoms require it. In addition to these, the ordinary treatment for inflammation of a similar character, must be pursued, meeting the symptoms as they present themselves. In some cases, I have derived benefit from the officinal compound tincture of Virginia Snakeroot, administered in enema, half a fluidrachm to half a fluidounce of starch-water, every hour or two. The diet should be light and small in quantity, consisting principally of boiled Milk, boiled Rice, Arrowroot, etc. Diarrhea more often occasions abortion than does constipation, in consequence of tenesmus, and which usually occurs about the third month. As with all other affections during pregnancy, care must bo taken to avoid active or powerful catharsis whatever may bo the agents employed in their treatment.

Heartburn, or *cardialgia*, is a distressing symptom, and may be present during the early period of conception, not until the third or fourth month, or may be entirely absent. It may be occasioned by sympathetic action, by the use of certain articles of diet, and by the presence of bile in the stomach, but most generally, it arises from acidity of the stomach; it is also said to be caused by emotions of the mind, and an affection of the eighth pair of nerves. There is heat or a burning sensation in the epigastric region, which extends upward along the esophagus, with pyrosis or eructations of a clear, bilious, sour, and bitter fluid, and is frequently accompanied with a peculiar sensation of dragging from the stomach toward the spine; eating aggravates the difficulty. There is usually no febrile or other constitutional disturbance present; the appetite is commonly impaired. This symptom may usually be mitigated by an attention to the bowels, removing acidity by alkalies in aromatic infusion, by a rigid attention to diet, which should be light, nourishing, and easy of digestion, and by the use of moderate exercise in the open air. In very painful and obstinate cases, counter-irritation, as sinapisms, etc., applied to the epigastrium will be productive of benefit. A long-continued use of alkalies will injure the tone of the stomach. Sometimes, alkalies will fail to produce the slightest relief; in such cases, a resort to acids will often effect the desired result; solution of Citric Acid, Tartaric Acid, or Lemon-juice may be used, or Elixir of Vitriol. As soon as some relief has been afforded, an attempt may be made to invigorate the powers of the stomach, for which purpose I have met with much benefit from a pill composed of Sulphate of Quinia, ten grains, alcoholic extract of Nux Vomica, one grain, Ptelein, a sufficient quantity to form a pill-mass; mix together, and divide into twenty pills, of which one may be given for a dose, and which should be repeated three times a day. Generally, females obtain a temporary relief from this symptom, when not obstinately severe, by taking Lime-water, or chewing Magnesia, Chalk, or Peach-kernels.

Gastrodynia, spasm or cramp of the stomach, is frequently the result of some error in diet, but may also be occasioned by cold, or violent mental emotions. Its attacks are often sudden, more transient than heartburn, but far more severe. Violent pains of a neuralgic character dart from the sternum through to the back or shoulders, being accompanied with great distension, flatulence, restlessness, and anxiety; it may be so severe as to occasion premature labor, or the death of the fetus. The treatment should be prompt and energetic, warm fomentations, or sinapisms should be applied to the epigastrium, the bowels should be opened by a mild laxative clyster, and an opiate administered, as the officinal compound powder of Ipecacuanha, and Opium. In some instances of a severe and obstinate character, I have succeeded in giving relief with the officinal compound tincture of Lobelia and Capsicum, also with the tincture of Gelseminum. When the attacks are frequent, they may be overcome by keeping the bowels regular, neutralizing acidity of the stomach, and administering a solution of Sulphate of Quinia, in tincture of Gelseminum. The diet should be light, and nutritious, avoiding fats, acids, and stimulants. Alkalies, aromatics, and antispasmodics, are the only internal remedial agents generally required.

Constipation is a common attendant of pregnancy, and is frequently very obstinate and troublesome. It is caused by the compression of the gradually-developed uterus upon the rectum, which diminishes its diameter as well as impairs its activity; constipation may also be owing to digestive derangements, improper food, sedentary living, and other causes calculated to lessen the energy of the intestines. Various symptoms depend upon this condition of the bowels, as headache, or a sense of fullness and weight in the head, sleeplessness, irritability, pains in the abdomen, bloody mucous discharges, nausea, and, in the latter period of pregnancy, false pains. Sometimes, notwithstanding accumulation of fecal matter in the intestines, there will be small daily discharges of a liquid character. Constipation is a symptom always to be dreaded in the pregnant female, because of its liability to produce abortion from the large amount of feces collected in the rectum, requiring great expulsive effort to remove, as well as its tendency, at the time of parturition, to cause protracted labor, peritonitis, or convulsions. Piles are usually a consequence of constipation in the pregnant female. In the treatment of costiveness during pregnancy, I prefer the use of warm laxative enemas to active purgatives administered by the mouth, and for this purpose an infusion of Boneset with the addition of Molasses and Castor Oil, may be used daily, and after the rectal accumulation has been removed, a daily enema of warm water may be substituted for the previous one. If medicine is required, I prefer small laxative doses of Rhubarb and Bicarbonate of Potassa or Soda, to any other agent with which I am acquainted. Active cathartics are seldom required, and should always be used with great care during pregnancy, on account of their tendency to produce premature labor; the secret of success consists entirely in maintaining one daily alvine evacuation. I prefer scooping out the contents of the rectum in these cases, to the use of cathartics, to be followed by enema of warm water, and powders of Rhubarb and alkaline Bicarbonate, daily. In diarrhea, the practitioner should always ascertain if it was preceded by constipation, and should this be the case, laxative measures must be the first adopted. No female should be allowed by a physician to enter the parturient state with constipated bowels; and in those instances where the practitioner attends the patient previous to full term, he is highly reprehensible if he neglects the proper attention to this condition. The diet in these cases may be such as to assist very much in bringing about the desired regularity, without the aid of physic, as brown bread, mush and molasses, hasty pudding and molasses, figs, stewed prunes, dates, ripe fruits, and dried laxative fruits stewed, as apples, peaches, plums, etc. Any irritability of the bowels which may follow a removal of constipation can be allayed by some gentle sedative, as extract of Hyoscyamus.

Headache, or *cephalalgia*, is of very common occurrence during pregnancy, and attacks all temperaments. The pain may be constant or periodical, acute or dull, and may be located in one particular part of the head, or over the whole of it. Sometimes, especially when acute, it is also of a throbbing character, and not unfrequently there is an intolerance of light and sound. Usually it is owing to some deranged condition of the digestive organs, and may be readily removed by a mild laxative or two, and subsequent attention to diet. It may, likewise, originate from mental emotions, fatigue, stimulants, and coitus. The headache which occurs during the early months of utero-gestation is of a nervous character, and is not regarded as a dangerous symptom; while that which occurs during the latter months, is owing to plethora, is usually attended by evident signs of cerebral congestion, and must be treated promptly and energetically, that serious results may not ensue. This latter form, unlike the former, instead of being relieved by the recumbent position is more or less aggravated by it, and is frequently accompanied with a quick, full, and strong pulse, flushed countenance, suffused or heavy eyes, heaviness of the lids, and photophobia;

the carotids pulsate with unusual force, and a sensation of giddiness is present, which is increased on stooping. If this form of headache is permitted to continue without relief it will almost assuredly terminate in convulsions.

The *nervous* form of headache may be removed, as before observed, by regulating the bowels, and attending to the diet; and, probably, antispasmodics may be required, as some preparation of Valerian, Black Cohosh, Scullcap, Ladies-slipper, Camphor, or even Stramonium, Hyoscyamus, etc.; and in some severe instances, counter-irritation to the sub-occipital region, or behind the ear. I have derived considerable advantage from a pill composed of Sulphate of Quinia, half a grain, hydro-alcoholic extract of Black Cohosh, one grain and a half, and extract of Belladonna, one eighth of a grain: of which, two or three are to be given daily.

The *plethoric* variety requires somewhat different treatment; the bowels must be kept entirely free from any disposition to constipation, counter-irritation must be intermittingly applied to the whole length of the spinal column, and active diuretics may be safely and freely given. In very severe cases cupping may be applied to the temples, or nape of the neck. Moderate diaphoresis will likewise be found serviceable, and should be effected by the use of the simple diaphoretic herbs in infusion, without the administration of any preparation of opium. Although local depletion may act as a beneficial palliatory measure, yet general bleeding, which is so frequently resorted to and recommended by certain physicians and authors, must be specially guarded against, as it debilitates the female, rendering her liable to premature delivery, tedious labor, perhaps requiring instrumental aid, or hemorrhage after parturition, and frequently tends to the destruction of the fetus. When the severe symptoms have been renewed, the officinal compound syrup of Partridgeberry, or the Parturient Balm, may be employed and continued daily up to the full term.

Convulsions often attend the condition of pregnancy; their most usual periods of attack are in the latter months, during parturition, or shortly after delivery. Those convulsions attended with or preceded by signs of general plethora, and cerebro-spinal congestion, and commonly termed "puerperal convulsions," will be treated of in another part of the work. At the present time, I would call attention to a form of convulsions, which I have met with as early as at the second month of gestation, and which occurs much more frequently than the true puerperal convulsions. They most generally occur in anæmic or hysterical patients, or in those whose nervous systems have been exhausted by any depressing cause, and though when the attacks are light no bad results follow, yet they frequently occasion premature labor, or by appearing at the parturient period, perplex, embarrass, and, perhaps, alarm the practitioner. They are, undoubtedly, of an hysterical character, and differ from the true puerperal convulsions, in being often preceded or attended by the globus hystericus and borborygmus, with a small, hard pulse peculiar to ordinary hysterical attacks; the motions of the limbs are likewise more violent, the eyes roll or stare with a wild expression, and though they may be unnaturally brilliant, yet there will be no suffusion, and the pupil is not insensible. Occasionally the ordinary concomitants of sobbing, crying, or screaming will take place. Urine, of a pale color, is frequently voided in large quantities. In the treatment of this form of convulsion I place the greatest reliance on the officinal compound tincture of Lobelia and Capsicum, (*Antispasmodic tincture,*) which may be administered in doses of from a fluidrachm to half a fluidounce, and should be repeated every ten or twenty minutes, according to the indications, until the attack has been overcome. Usually the first dose, if sufficiently large, will suffice; sometimes a second will be required, and rarely a third. In the meantime, during the absence of these convulsions, the patient must be placed upon a generous diet of an easily digestible character, the bowels must be kept regular, wine or ale may be allowed, with some chalybeate preparation, the use of which should be continued during the whole course of utero-gestation, unless otherwise contra-indicated; all exciting influences should be removed as much as possible, quiet should be enjoined, excessive depletion by diaphoresis, diuresis, or catharsis are to be avoided, and coitus must be absolutely prohibited. In these instances, I commonly leave the antispasmodic tincture with the patient, to be administered by her friends whenever an attack occurs, and which effects its influence without the necessity of my presence on every occasion. With this class of patients, the practitioner should always be very careful to have a vial of the above tincture on hand at the period of parturition, for it not uncommonly happens that one or several attacks come on during the labor, as well as subsequently, and which may be immediately overcome by its prompt administration, as has invariably been the case in my own practice.

According to Andral and Gavarret, the fibrin of the blood is diminished during the first six months of pregnancy, but subsequently becomes augmented, even to a considerable amount above the usual physiological portion, assuming the characteristics of inflammatory blood, and manifesting the buffy coat after venesection. In addition to which, the quantity of the blood is also considerably increased beyond the usual normal proportion. These changes in the blood are, very probably, due to an increased nutrition, by which chyle is formed in greater abundance from the food, and conveyed to the bloodvessels. This plethoric condition is a natural and salutary consequence of pregnancy, and under ordinary circumstances requires but little attention, further than active exercise and moderate diet. But occasionally these additions to the quantity and quality of the blood become so great as to develop symptoms demanding prompt therapeutic treatment, which is more especially the case with indolent females, those who live luxuriously, and those of sanguine habit; it may also be induced by constipation. These symptoms are headache, somnolence, flushed face, vertigo, dyspnœa, full and frequent pulse, heat of the skin, depressed spirits, and high-colored urine. Sometimes the general plethora gives rise to local plethora, which may be followed by congestion of a serious character in the brain, lungs, or uterus. This latter organ, during pregnancy, is the most liable to hyperæmia, which may be known by a sensation of fullness and weight in the pelvis, groins, and thighs, tension or swelling of the abdomen, pain in the kidneys or loins, and even symptoms of premature labor; and, not unfrequently, this condition of the mother exerts an influence on the fetus, in consequence of which, its movements become less frequent and weaker, or perhaps cease altogether, but which, if not allowed to proceed too far before giving relief, will again appear with the removal of the local plethora.

Whenever the symptoms of general or local plethora become so severe as to require remedial measures, and no symptoms of approaching miscarriage have been manifested, it will frequently be advisable to commence the treatment with a cathartic, followed by diuretics, which will be found to exert a safer and more salutary depletory influence, than even general bleedings, which are so highly recommended by many medical writers. Counter-irritation by dry cupping, sinapisms, or other means should be applied to the upper portion of the spine; the legs and arms may be rubbed or bathed with some stimulating liquid, and very frequently the wet sheet, or rather bandage, applied around the abdomen and pelvic region will effect much benefit; if the case be very severe, tending to a miscarriage, cupping may be pursued, applying the cups to the loins and over the sacrum. On no account must large or small general bleedings be had, for though they may occasionally be followed by present relief, yet their after consequences are much to be dreaded; beside it is a well-established fact at this day, that bleeding rather increases than diminishes the tendency to an inflammatory condition of the blood. After the symptoms have been removed by the above treatment, the subsequent measures should be light diet, moderate exercise, regularity of the bowels, and the use of the Parturient Balm, which will be found a most excellent agent at this time, with an occasional use of diuretics, and the wet sheet or bandage. Hemorrhage, or symptoms of miscarriage, are to be treated as laid down elsewhere for these difficulties.

I should observe here, that local congestion of the uterus, or of any other organ is not necessarily connected with general plethora, but may exist with a state of general anæmia; under which circumstances, the nervous and vascular systems will be found in an extremely excitable condition. In such cases, after the removal of the local hyperæmia, proper attention should be bestowed upon the existing anæmia.

Odontalgia, or *toothache*, is frequently a troublesome symptom with pregnant women; it may occur with or without caries, and may appear at any period of utero-gestation, often continuing until parturition; the pain is most usually intermittent, but is occasionally continuous. Generally, it is owing to increased irritability of the nervous system, and at times to a sanguineous congestion of the jaw. As the extraction of a tooth during pregnancy is frequently followed by premature labor, it is not prudent to resort to this expedient, even should caries be present; and it seldom happens that any alleviation of the suffering follows the operation. However, should the pain be owing to a carious tooth, the patient suffering severely without any relief being afforded, and other means have failed, then the tooth may be extracted by a skillful dentist, and probably the administration of chloroform would entirely prevent any bad influence upon the generative system from the shock of the operation. The proper treatment in these cases is the administration of antispasmodics with tonics, as combinations of Scutellarin, Cypripedin, hydro-alcoholic extract of Cimicifuga, with Sulphate of Quinia, or, tincture of Gelseminum with Quinia; the bowels should be kept in a regular condition by gentle laxatives; and as a local application, washing the mouth frequently with cold or tepid water and salt will be found useful. In very severe and obstinate cases, counter-irritation behind the ears will be followed by excellent results, as a sinapism, stimulating liniments, and even the irritating plaster. Tincture of Aconite root, employed in friction beneath the ear, is said to be a very effectual remedy, and is certainly deserving a trial in this distressing complaint. If caries be present, the cavity should be cleansed, and the following mixture applied on cotton or lint, and frequently repeated until relief is obtained, viz: Take of Oils of Cajeput, Cloves and Amber, each, one fluidrachm, Camphor one drachm, rub the Camphor with the oils until it is dissolved. Or, the officinal compound tincture of Camphor, may be applied similarly. In the toothache of pregnancy, the breath is very apt to be acid, and will redden litmus; frequently, when constipation is a concomitant, its removal will be followed by a cessation of the pain.

It is frequently the case that the nervous excitement produced in the uterus by the condition of pregnancy extends to the kidneys and ureters, giving rise to spasmodic action of the ureters, attended with severe pain along their course, and often strangury, and which, if not promptly relieved, may induce premature labor. In these instances counter-irritation should be applied over the lumbar region, and sedatives administered internally. The tincture of Gelseminum alone, or combined with the tincture of Cimicifuga, will prove a very useful remedy. Where strangury is present, an infusion of Marshmallow root, with tincture of Camphor will be found beneficial, together with an application of pounded Onions over the pubic region.

The bladder may likewise become the seat of sympathetic nervous excitement, especially the urethra and neck, giving rise to a constant sensation or desire of urinating, and the urine passes in small quantities, frequently with pain and difficulty, and is likewise, with some patients, attended with excessive irritability of the external generative organs, and more or less severe and distressing itching, which is increased at night. The internal use of mucilaginous diuretics will occasion much relief; infusion of Marshmallow root and Trailing Arbutus, or Marshmallow and Peach leaf, with ten or twenty drops of the spirit of Nitric Ether may be given, and repeated several times a day; sometimes, liquor Potassa may be advantageously combined with the di retic infusion. The bowels should be kept regular, and the diet sho be of a mild, not stimulating character. For the itching of the g tals, cold applications should be employed, and the parts kept cleansed.

Occasionally, from pressure, or perhaps from an increased dete tion of blood to the uterus, which withdraws this fluid from the ate neighboring parts, there will be found a torpor of the giving rise to a retention of urine and its difficult passage. ' more serious difficulty than the previous one, on account of its following mixture applied on cotton or lint, and frequently repeated until relief is obtained, viz: Take of Oils of Cajeput, Cloves and Amber, each, one fluidrachm, Camphor one drachm, rub the Camphor with the oils until it is dissolved. Or, the officinal compound tincture of Camphor, may be applied similarly. In the toothache of pregnancy, the breath is very apt to be acid, and will redden litmus; frequently, when constipation is a concomitant, its removal will be followed by a cessation of the pain.

It is frequently the case that the nervous excitement produced in the uterus by the condition of pregnancy extends to the kidneys and ureters, giving rise to spasmodic action of the ureters, attended with severe pain along their course, and often strangury, and which, if not promptly relieved, may induce premature labor. In these instances counter-irritation should be applied over the lumbar region, and sedatives administered internally. The tincture of Gelseminum alone, or combined with the tincture of Cimicifuga, will prove a very useful remedy. Where strangury is present, an infusion of Marshmallow root, with tincture of Camphor will be found beneficial, together with an application of pounded Onions over the pubic region.

The bladder may likewise become the seat of sympathetic nervous excitement, especially the urethra and neck, giving rise to a constant sensation or desire of urinating, and the urine passes in small quantities, frequently with pain and difficulty, and is likewise, with some patients, attended with excessive irritability of the external generative organs, and more or less severe and distressing itching, which is increased at night. The internal use of mucilaginous diuretics will occasion much relief; infusion of Marshmallow root and Trailing Arbutus, or Marshmallow and Peach leaf, with ten or twenty drops of the spirit of Nitric Ether may be given, and repeated several times a day; sometimes, liquor Potassa may be advantageously combined with the diuretic infusion. The bowels should be kept regular, and the diet should be of a mild, not stimulating character. For the itching of the genitals, cold applications should be employed, and the parts kept well cleansed.

Occasionally, from pressure, or perhaps from an increased determination of blood to the uterus, which withdraws this fluid from the immediate neighboring parts, there will be found a torpor of the bladder, giving rise to a retention of urine and its difficult passage. This is a more serious difficulty than the previous one, on account of its tendency to produce retroversion of the uterus. It must be met with diuretics, as infusions of Queen of the Meadow root, Wild Carrot, Trailing Arbutus, Dwarf Elder, etc.; the patient should be advised to empty the bladder often, if possible, by her own efforts, and should these means fail, the urine must be removed by the careful introduction of a catheter: which operation must not be delayed for too long a period.

Syncope, or *fits of fainting*, frequently attend the pregnant condition, and may occur at any period from conception to parturition, though more commonly during the earlier months; vertigo, or dimness of sight, is also apt to be present, with sometimes tinnitus, and weakness of the knees. These affections may be owing to debility from whatever cause, to extreme nervous susceptibility, or to plethora. Syncope generally occurs while the patient is standing, is seldom of long duration, and very seldom causes any serious results. However, when frequently repeated it may induce premature labor, which should be carefully guarded against. The treatment should be that usually pursued in syncope at other times; put the patient in a recumbent position, in a place where there is a circulation of cool air—dash cold water on the face—apply Ammonia, Ether, or Vinegar, etc., to the nose, and after her recovery, should there be much debility, with coolness of the surface, diffusible stimuli may be administered internally, with frictions to the limbs, and, in severe cases, along the spinal column. When the attacks are severe, and occur frequently, the officinal compound syrup of Partridgeberry, may be given two or three times a day, with benefit; and if the patient be weak, tonics may also be employed.

Palpitation of the heart is not an unusual occurrence, during pregnancy; it is a distressing symptom, and though by no means dangerous, it occasions much alarm to the patient. It may happen at any period of utero-gestation, and may be owing to mental excitement, derangement of the digestive organs, pressure, flatulency, or sympathetic nervous irritation. During its presence, it may be relieved by the administration of an alkali, if acidity and flatulency are present; by a mild laxative if the bowels are confined; and under other circumstances, Ether, Chloroform, compound spirits of Valerian, Musk, or other antispasmodics may be employed, according to indications. Ten or twenty drops of the tincture of Digitalis, given daily, will frequently overcome the difficulty. During the interval, the compound syrup of Partridgeberry will be found beneficial in preventing a return of the palpitation, and should the patient be of an anæmic habit, the proper chalybeates must be used in conjunction. The diet must be mild and stimulating, the patient should exercise moderately, her dress should be loose, coitus should be abstained from entirely, and the mind should be kept perfectly tranquil.

Dyspnœa, or *difficulty of breathing*, may occur, in the early months, from sympathy, and at a later period from plethora, or from pressure of the enlarged uterus; it may likewise be owing to derangement of the digestive organs, thoracic disease, cardiac disease, tumors, etc. The treatment will consist in the administration of antispasmodics, as Lobelia, Ether, etc., attention to the regularity of the bowels, and a course similar to that just named for palpitation. When owing to organic diseases, or congestion of the lungs, these must be attended to according to their indications. When the difficulty is owing to the enlargement of the uterus, but little relief can be expected until the delivery of the fetus, hence, there is no necessity for injuring the patient's system, by the employment of medicines.

Cough sometimes occurs, independent of cold or existing disease, and which, in the earlier months, is owing to sympathetic action; in the latter, to pressure. The cough is usually short, dry, hacking and constant; occasionally very severe, with but little or no expectoration, no febrile symptoms, and no change in the pulse, and is apt to cause premature delivery. It may be treated by narcotics, antispasmodics, rest, and regularity of the bowels, with a proper attention to diet. In one case far advanced in pregnancy, where the cough was very severe and incessant, and had resisted all previous means for several weeks, I succeeded in affording relief by applying a stimulating plaster between the shoulders, and giving internally one fluidrachm of the following compound, three times a day, and half a fluidrachm in the intervals, whenever the cough proved troublesome: Take of tincture of Lupulin, tincture of Scullcap, each, one fluidounce, tincture of Hyoscyamus half a fluidounce: mix.

Mastodynia, or a painful and distended condition of the breasts, is very apt to attend pregnancy, especially with primiparæ, and may be owing to the rapid development of these organs and flow of blood to them. When severe, relief is frequently afforded naturally by a thin, colorless, serous discharge from the nipple. To relieve congestion, and prevent inflammation, which are the principal indications, tepid fomentations may be applied, together with an anodyne liniment, as a mixture of Oil and Laudanum; the bowels must be kept free, and all pressure upon the breasts removed.

Muscular pain about the pelvis and hips, as well as the abdomen, frequently accompany pregnancy; the cause of these pains is supposed to be owing to pressure on the anterior branches of the sacral nerves; but this could only happen when there has been a descent of the uterus, at the termination of utero-gestation, for prior to this period the uterus is too much elevated for its inferior portion to compress these nerves. As these pains are more common after fatigue, they are probably dependent on an irritable condition of the nerves of the painful muscles, and should be treated principally by rest. In severe cases, stimulating liniments may be rubbed over the affected parts, and the back; and the pain of the abdominal muscles may be frequently relieved by the use of a bandage.

Mania, or *insanity*, usually attacks pregnant females of a hysterical disposition, or those who are hereditarily predisposed to it. It may occur at any period of utero-gestation, from conception to parturition, and as a general rule, is not so severe as that which occurs in the puerperal state, and ceases with delivery. The treatment must be principally moral, meeting any symptoms which present themselves, according to their indications; employing tonic means, where debility is present; antispasmodics and sedatives, where there is much nervous irritability; and the means recommended for plethora, should this exist. The application of cold to the head, stimulants to the spine, and cups to the temples or back of the neck, should always be employed, as may be indicated, to overcome any local congestion. When the mania is acute, treat it in the manner recommended for Puerperal Mania, *which see.*

Beside the several affections which have just been named, as owing to nervous sympathy and deranged circulation, there will be found certain changes in the mental condition of the patient; thus she may become very *despondent*, or very *irritable*. The former, when severe and obstinate, and accompanied with gradual loss of health, may terminate eventually in puerperal mania; the latter has nothing serious in its tendency, and disappears after delivery. The first must be treated by moral as well as therapeutical means; the patient should be kept from all depressing circumstances, should be led into cheerful society, where she will not hear of any wonderful or fatal accidents having occurred to parturient women, and should be exhorted to overcome the tendency to despondency as much as possible; the therapeutical measures should be laxatives, cold to the head, diuretics, etc., if plethora exist; and chalybeate tonics when an anæmic condition is present.

The second should be treated by the use of the compound syrup of Partridgeberry, or the Parturient Balm, keeping the bowels regular, and should wakefulness be present, the powder of Ipecacuanha and Opium may be administered, or tincture of Aconite root, tincture of Hyoscyamus, tincture of Gelseminum, etc. The patient should take moderate, but regular exercise daily in the open air, and the diet should be of a non-stimulant and non-heating character.

Pruritus of the Vulva, Prurigo, or *itching of the Genitals,* occurs during the early months of pregnancy, and is sometimes very distressing; occasionally it continues during the whole period of utero-gestation, and disappears immediately after delivery. It may be caused by uncleanliness, acrid discharges, and frequently, according to Dewees, from aphthous efflorescence of the vulva; at times, it occurs without any known cause. In the treatment of this distressing symptom, means must be employed according to its severity, and the pathological condition of the parts affected. In the greater number of cases the officinal Borax Lotion, with Morphia, will be found efficient; if much inflammation of the parts is present, a weak solution of the Sesquicarbonate of Potassa, or of Nitrate of Silver may be applied locally, and as it subsides an astringent infusion may be substituted, as of Geranium and Golden Seal; a compress of lint or soft linen should be moistened with these applications, and placed between the labia immediately in contact with the affected parts. In all cases the bowels should be kept regular, and the parts well cleansed. Occasional tepid baths may be employed with benefit, and sometimes the induction of diaphoresis will produce a favorable result. Internally, but little means are required; the compound syrup of Partridgeberry may be administered, or a pill composed of one grain each of hydro-alcoholic extract of Black Cohosh, Ferro-cyanuret of Iron, and Sulphate of Quinia, may be given three or four times a day. The officinal compound Ointment of Bayberry applied on lint, I have found highly successful in a number of cases; and in others, the disease has disappeared as if by magic, upon the local application of a lotion composed of a saturated aqueous solution of Sulphurous Acid Gas, one fluidounce, and rain-water three fluidounces. The saturated solution may be made by passing a stream of the gas through water, until this is saturated. Wet a piece of lint or l with it, and apply to the part.

CHAPTER XVIII.

DISEASES OF THE PREGNANT FEMALE—*Continued.*

The symptoms or affections originating from compression of the enlarged uterus upon neighboring organs are several. *Œdema*, or serous infiltration into the cellular tissue of various parts of the body, will be first noticed. It may occur in the early months of pregnancy, but is most common in the latter months, and is generally attributable to pressure of the enlarged uterus upon the bloodvessels of the pelvis, thereby interrupting the circulation, and finally resulting in effusion. It is not, however, always produced from this cause, as frequently the size of the uterus bears no proportion to the extent of the œdema, but is unusually small; and, again, we frequently find the uterus enormously distended, either by excess of liquor amnii or plurality of children, without any accompanying œdema. In those instances where the swelling is caused by uterine pressure, it is mostly confined to the lower extremities, but where it spreads over the whole body, it is due to plethora, or renal congestion, which may be known by the presence of albuminaria, and either of which is unfavorable. Convulsions are very apt to succeed œdema from these latter causes. Ordinarily, no pain accompanies this affection, yet, occasionally, it is very painful. Where the swelling is confined to the feet and ankles, quickly disappearing on assuming the recumbent position, but little treatment is required; but where it becomes so great as to render the recumbent position almost impossible, from dyspnœa, or where it is complicated with effusion into any of the important cavities of the body, it becomes of a serious nature, and requires energetic treatment. In the milder cases, when confined to the lower extremities, and where treatment is required. relief may be afforded by the administration of laxatives, with cold applications to the œdematous part, at the same time supporting the limbs with a bandage well applied. In severe cases, purgatives and diuretics will be beneficial, and it will often become necessary to induce premature labor as the only means of saving the patient's life. who can not possibly live up to the full period. with an increasing infiltration. When œdema is not de[illegible] a important organic lesion, it usually disappea[illegible] renal congestion is a cause of the effusion, [illegible] tment, cups may be applied over the regi[illegible] nate, a discharge may be maintained fro[illegible] plaster. Puncturing and scarification of the œdematous limbs are advised by some authors, but they should not be attempted, as they are most usually followed by gangrene.

When by pressure of the enlarged uterus upon the pelvic bloodvessels, the circulation within the lower extremities is obstructed, it gives rise to a *varicose condition of their veins.* This difficulty is a frequent accompaniment of the latter months of utero-gestation, and is more apt to occur in women of an advanced age, than in young females. As they are owing to the impeded circulation in the extremities, their cure can not be effected until the cause is removed, when they usually disappear spontaneously. Sometimes, they continue after delivery, gradually increasing, and on each subsequent pregnancy augmenting considerably in size, forming tumors which are more or less painful, embarrassing the movements of the female, and often terminating in obstinate ulcerations. Rupture of these veins is the principal accident to fear, as it may prove fatal, and the practitioner's treatment should be especially directed to a prevention of its occurrence. The patient should not be long at a time on her feet, but should keep in the horizontal position, with the dress loose, and the employment of properly graduated pressure over the veins by means of bandages, or elastic stockings. The bowels should be kept free, the diet spare, and the bandages may be kept moistened with cooling applications, especially in severe cases. If the varices are situated in the genital parts, as the vulva or vagina, compresses moistened with cooling lotions may be applied, and occasionally the application of leeches on the adjacent parts may become necessary to prevent rupture, which sometimes happens, especially at the time of parturition, during the passage of the fetal head through the pelvic canal.

From a cause similar to the above, *hemorrhoids*, or *piles*, may be produced, and more particularly if constipation be present. Occasionally they are an attendant of diarrhea. They are similar in nature and appearance to those occurring at other times, and require the same local treatment. When slight, they may be removed by producing regularity of the bowels by means of laxative medicines, among which I prefer the combination of powdered Rhubarb and Bicarbonate of Potassa, with cold and astringent applications to the parts. If pain or irritation exist, narcotic ointments, as Poke, Stramonium, etc., may be applied with benefit, and where the tumor protrudes externally, the pain and irritation may be relieved by the application of an Elm poultice sprinkled with Laudanum, or a cataplasm of Poke leaves, or Stramonium leaves may be substituted. The removal of piles by an operation, during pregnancy, is totally inadmissible and unjustifiable. Nor can a perfect cure be expected until after parturition, when the pressure has been removed by a return of the uterus to its non-gravid condition. I have derived considerable benefit in this difficulty from an ointment composed of Stramonium, one ounce, Alum two drachms, Sulphate of Morphia ten grains; mix, and apply a small quantity on lint or cotton. Another valuable local application may be prepared as follows: Take of Stramonium leaves, Poke leaves, Tobacco leaves, of each, while green or fresh half a pound; dilute whisky two pints. Mix them together, and boil down to one pint; then add Olive Oil one pint, and reduce by means of a gentle heat to one pint, and strain. The tincture may be prepared by displacement, instead of the above mode, and if more than a pint be obtained, reduce it by heat. An infusion of Solomon's Seal root, used by mouth and by enema, will likewise prove useful in piles; it appears to exert a special influence over the mucous membrane of the alimentary canal throughout, when in an irritated or abnormal state. Occasionally the pain and irritation become so excessive that five or six leeches may be required to remove the increase of blood accumulated in the part, and thereby mitigate the suffering; but, as a general rule, their use should be avoided as much as possible. Many other remedies have been employed in piles with benefit, and others may suggest themselves to the mind of the practitioner, but whatever local means may be used, it is of the greatest importance to keep the bowels regular, the diet spare, but nutritious and easily digested, and avoid too much exercise, or even long standing.

Should hemorrhage be present, it must be checked, especially when considerable, or it may occasion miscarriage; for this purpose astringents, cold applications, and compression may be employed. A preparation composed of Stramonium ointment one ounce, Styptic Powder (calcined Sulphate of Iron), two drachms, and powdered Alum, one drachm, employed as a local application, and introduced as far as possible into the rectum by means of the finger or otherwise, together with the internal use, three or four times a day, of a mixture of Rhubarb eight grains, Bicarbonate of Potassa, powdered Rosin, each, four grains, will be found very valuable in all cases of hemorrhoids accompanied with hemorrhage.

Prolapsus ani, is occasionally met with as a concomitant of piles, or it may occur independently; it is often attended with excessive pain during an alvine evacuation, togeth [illegible] sing tenesmus, and is usually produced by the same causes which occasion piles, viz: pressure. This symptom is exceedingly annoying and distressing, and but little can be done toward a cure of it, until after delivery is accomplished, when, as a general thing, the cause being removed, a spontaneous cure is effected. Palliative measures are all that can be employed, and I have found the most benefit to accrue from the following course: Immediately after defecation, which is the time in which the prolapsus commonly occurs, or at any other time when it may happen, wash the prolapsed part in cold water, return it, and immediately inject into the rectum about an ounce of a strong infusion of equal parts of Solomon's Seal root, Geranium root and Poke leaf; apply a compress of cotton over the anus, and have the injection retained as long as possible. Prolapsus ani is a very troublesome affliction during parturition, as every pain is apt to cause a protrusion of the bowel, rendering it irritable and most acutely sensitive.

Cramps of the inferior extremities, sometimes extending as high as the upper pelvic region, are occasioned by pressure of the gravid uterus upon neighboring nerves; they may likewise be occasioned by fatigue, constipation, or extension of ligaments. They are sudden in their attacks, are occasionally very frequent and painful, and mostly occur during the latter months of pregnancy. Friction over the affected part, and change of position will ordinarily remove them; and when they are frequent in their attacks, relief can often be afforded, and this disposition to frequency obviated, by attention to the bowels, together with the use of the compound syrup of Partridgeberry. I have used the following preparation, in many instances, and it has proved an excellent palliative: Take of High Cranberry bark two ounces, Scullcap leaves, Skunk Cabbage root, each, one ounce, Capsicum, Cardamom seeds, each, half an ounce; bruise the articles and digest them for two or three days in two quarts of Malaga wine. The dose is a tablespoonful three or four times a day. The soreness caused by the cramps may remain for some time after their cessation, and may be removed by rubbing the parts with some camphorated oil, or the officinal compound tincture of Camphor. Gelseminum may also be administered with benefit.

The pregnant female frequently suffers from a deep-seated *pain in the right side*, which most commonly manifests itself after the fifth month; it is unaccompanied by cough, or any febrile or inflammatory symptoms, and is attributed to the fundus of the uterus pressing against the concave surface of the liver. It is not present until after the ascent of the uterus above the superior strait—never occurs in left lateral, or anterior obliquity of the uterus, but only in right lateral obliquity, and is much relieved, after the eighth month, by the falling or descent of the uterus into the pelvis. Permanent relief can not be had until after delivery, yet when severe, the female may derive considerable benefit from change of position, standing, lying on the left side, stretching upward, and leaning to one side; in addition to which the bowels should be kept free by a powder composed of Rhubarb six or eight grains, Leptandrin two grains, and Bicarbonate of Potassa four grains; mix for a dose, and repeat it two or three times a day. When the pain is excessively severe, cupping will sometimes mitigate it. The diet should be light and non-stimulant.

Jaundice, occasionally occurs during pregnancy, and is owing to pressure upon the gall-ducts by the neighboring viscera, which are compressed by the gravid uterus, in consequence of which there is not a free escape of bile; it is more severe when it happens during the latter months, and is usually attended with dyspeptic symptoms. But little can be done for this evil; though it is proper to regulate the bowels, and attend to the diet. Should it remain after delivery, it must be met with the appropriate treatment.

Females who have given birth to many children are sometimes annoyed with a *lax condition of the abdomen*, in which the abdominal parietes, from their excessive looseness, do not afford support to the enlarged uterus, thereby allowing it to fall in any direction. The best treatment, in such cases, is a local application composed of astringent and slightly-stimulant agents, together with mechanical support by means of an appropriate belt or bandage, and the patient should assume the recumbent position daily, for three or four hours at a time.

In opposition to this, we frequently meet with a very *rigid condition of the abdomen*, in which its parietes do not give way in proportion to the gradual augmentation of the volume of the uterus. This is
common among primiparæ, occasioning much distress, in consequ
the tender and irritable condition of the parts, the skin over w
cracks. This may sometimes be relieved by rubbing Sweet
Oil, simple ointment, etc., over the part, and if very pain
it may be fomented with Hops, Poppy heads, Elm
wort, etc. Internal treatment is useless.

There are other symptoms occasionally met with
which are due to pressure, or nervous and vascul

ment, and which deserve a passing notice. Thus, in the latter months of pregnancy, females are unable to retain their urine, which escapes upon the least exertion, and may or may not be accompanied with tenesmus or a frequent desire to evacuate the bladder; this *incontinence of urine* seldom admits of relief until the removal of the cause—the pressure upon the bladder by the enlarged uterus—by delivery; perhaps, some benefit may accrue by giving support to the abdomen. It is a very annoying symptom, but is by no means dangerous.

Occasionally, *pustules* around the genital organs may appear, or vaginal *mucous discharges* of a whitish color, tinged sometimes with green, or blood. These symptoms disappear after delivery, and require no other treatment than cleanliness, frequently bathing and injecting the parts with an infusion of Golden Seal, or of Golden Seal and Geranium, or other similar combination. The practitioner must be careful not to injure his patient's reputation as well as his own, by pronouncing either of these as syphilitic, on too slight grounds, for they are often the legitimate results of pregnancy.

Pressure of the uterus is apt to occasion congestion of various organs, especially of the lungs or stomach, in consequence of which *hemoptysis* or *hematemesis* may result from exudation of blood from the mucous membrane. These hemorrhages may be treated by laxatives, sedatives, astringents, and the means employed for them when existing at other times. Should they, at the time of parturition, become excessive, resisting the treatment employed, the delivery should be hastened by artificial means.

There are likewise symptoms which occur during utero-gestation, depending upon an abnormal condition of the uterus or its contents. Among the displacements of the organ, *prolapsus*, or *descent*, are the most common, and it usually takes place during the first months, before the ascent of the uterus above the superior strait; the patient will complain of a bearing-down sensation, with pain and uneasiness in the sacral region, and frequently in the lower part of the abdomen. The prolapsus will be more or less perfect according to the capaciousness of the pelvis, and the laxity of the ligaments. Where there is an excess of pelvic dimension, a sudden prolapsus may take place in an advanced stage of pregnancy, from straining, over exercise, or some unusual exertion. This displacement not only occasions abortion, but is frequently caused by it from the uterus being left in an inflamed or hyperæmic condition; it may also be produced by straining, debility, and whatever circumstances would give rise to it in the unimpregnated state. This difficulty may give rise to very serious evils, and should be promptly treated; the rectum and bladder should first be evacuated; the prolapsed organ should then be carefully placed in its proper position, and retained there by a piece of fine sponge introduced into the vagina, and the patient should maintain as much as possible the recumbent position, until the increased volume of the uterus would prevent any further prolapse. The sponge may be moistened with some astringent lotion, if desired, and should be cleansed every two or three days. Any accompanying symptoms, as debility, constipation, etc., must be met by appropriate treatment. When we find an impaction of the uterus within the pelvis, rendering its reduction impossible, abortion will have to be induced.

Retroversion of the *gravid uterus*, is sometimes met with, as well as in the unimpregnated organ; in this displacement, the fundus is found backward, at or below the promontory of the sacrum, while the os tincæ is carried forward and upward, either upon, or above the pubic symphysis, and the vagina being dragged along with the os, its anterior wall will be likewise carried forward and upward, while its posterior wall will be considerably depressed. Retroversion of the uterus may come on slowly or suddenly, it seldom exists in the latter months of pregnancy, and usually takes place between the second and fourth months. It may be owing to various causes; a very common one is a retention of urine until the bladder becomes enormously distended, which extending backward and downward, thrusts the uterine fundus along with it in the same direction; or a large pelvis may predispose to this accident, but it is not an essential condition; ovarian enlargement, tumors, violent efforts, straining at stool, blows, falls, vomiting, polypus, hydatids, etc., are each capable of effecting this displacement under favorable circumstances. The symptoms accompanying retroversion are, a partial or complete retention of urine, which often takes place suddenly; when it is partial there is a desire to urinate frequently, the water passes off in small quantities at a time, but never in sufficient amount to empty the bladder, and finally, it involuntarily dribbles away, and the enormous distension of the bladder creates a chronic inflammation, or what is yet worse, it may become ruptured. Defecation is also very difficult, the feces being flattened and passing in small quantities; and both the dysuria and difficult defecation are increased by any efforts at evacuation. When retention of urine is present in the early months of pregnancy, the practitioner should suspect retroversion, and adopt the proper means to satisfy himself in relation to it. In connection with these two prominent symptoms, there will be an aching pain in the sacrum, thighs and pubes, with weight in the pelvis and disagreeable bearing down sensations. When retroversion is suspected in the pregnant female, an examination should be immediately demanded, for if it be not promptly attended to, it may occasion the death of both the mother and child, as may be readily imagined, when an enlarging uterus becomes impacted in the cavity of the pelvis, preventing micturition by its pressure upon the urethra, causing irremediable constipation by compression of the rectum, and intense suffering by pressure upon the anterior sacral foramina and nerves. Upon an examination per vaginam, which must in all cases be made, the uterine fundus will be found depressed below the promontory of the sacrum, with the cervix toward the bladder, and higher than the crown of the pubic arch; in some instances, the os uteri may be found in its normal position, with the fundus depressed, the cervix being bent or flexed at an angle, in which the uterus is shaped somewhat like a retort; this is termed retroflexion, and is not common in the pregnant condition. If this displacement be not relieved, the pains continue to increase, vomiting takes place, with peritonitis, and the patient dies from inflammation or sloughing; and it must be remembered, that the later the gestating period in which retroversion occurs, the greater is the danger.

In treating a case of this character, before any attempt at reduction is made, the bladder must be emptied by means of a male elastic catheter, bearing in mind that the displaced uterus, having elevated the neck of the bladder, causes an elongation of the urethra. Sometimes considerable difficulty will be experienced in introducing the catheter, which may be overcome by pressing the uterus backward, and thus liberating the urethra, until the instrument has entered. Soon after the evacuation of the bladder it will often be found that the uterus assumes its normal position without further interference; should this not take place, the rectum must be unloaded by copious injections, as an accumulation of fecal matter within it, will very much interfere with the attempt to replace the uterus properly. The patient is now to be placed upon her face, or the operation may be performed while she lies on her left side, and two fingers be passed into the posterior part of the vagina along the curve of the sacrum, until they come in contact with the presenting part of the depressed fundus, which must be pressed cautiously and firmly upward and forward, in the direction of the axis of the superior strait; for if the pressure be made in any other course, no reduction can be accomplished. When the reduction is effected, the womb assumes its position with a sudden jerk, and sometimes a clicking noise. Sometimes this attempt will fail; it will then be proper to introduce one or two fingers into the rectum for the purpose of pushing the fundus upward and forward, while a finger or two of the other hand enters the vagina, for the purpose of bringing down or depressing the cervix, and all these trials should be made steadily, cautiously and firmly. In very obstinate cases, the patient may be placed on her knees, having the pelvis elevated as high as possible, while the shoulders rest upon the bed, table, or whatever she is placed upon, and in this position, having the aid of gravitation, we may undertake the last named manipulation; this posture is a favorable one, inasmuch as it tends to overcome tenesmus and bearing-down efforts.

Having accomplished reduction, the patient should be kept in a recumbent state, until the ascent of the uterus above the promontory, when its volume has so far augmented as to render any further displacement of the kind impossible; and the bladder should likewise be emptied every four or five hours. Instances are sometimes met with, in which, after the organ has been reduced, it will not remain so, but falls over again upon the slightest exertion, and the operation will have to be performed again and again before the reduction will remain permanent. In these cases advantage has ensued from the introduction of a thin gum-elastic bladder, of a fusiform shape, into the rectum; the large end of this is to be introduced, after which it is to be distended with air, and constantly worn by the patient, until no longer required; it admits of easy removal at any time by permitting the inclosed air to escape, and then withdrawing it.

The reduction of the uterus may only be partial, so that although remaining in the pelvis, a part ascends giving the organ a deformed shape, still an attention to the bladder and rectum may enable the patient to reach the full term; in these cases the labor may be completed without artificial aid, though it may be tedious and difficult.

Where retroversion has occurred previous to pregnancy, and the organ is rendered almost immovable by adhesions, or where from other causes, after a persevering attention to the bladder and rectum, no permanent reduction can be obtained, it has been proposed to induce premature labor as the only means of saving life; but we must be cautious in a resort to this expedient, and should never undertake it without the opinion of a second or even third practitioner.

In *anteversion* of the uterus, the displacement is exactly contrary to the last; the fundus pressing forward toward the symphysis pubis, near the level of the superior strait, while the cervix is thrown backward and upward, the os uteri looking toward the hollow of the sacrum. This may originate from severe exertion while the bladder is empty, and is more apt to ensue when the ligaments are in a relaxed condition — from blows, falls, tumors, diarrhea, relaxed abdomen, fecal accumulations, etc. The symptoms are, a constant desire to pass urine, which is accomplished with some difficulty and heat; constipation is frequently present, with pelvic heaviness, hypogastric pain, and a distressing dragging sensation, which is augmented by standing or walking. It is rarely present during pregnancy, and when it does occur is not so serious as retroversion. The treatment is to elevate the fundus and pull down the cervix with a finger, or hook, and afterward, if required, a bandage may be worn, with a compress over the pubes; the bowels should be kept open, but the urine should not be passed too frequently.

An aqueous discharge, of a limpid, or yellow color, sometimes takes place during pregnancy, being variable in quantity, at times passing by drops, and again occurring suddenly and in large amount. It is called *hydrorrhea*, or, *false waters*. Usually this is not a serious affection, but occasionally uterine contractions of a severe character accompany it, which, if not overcome, will result in the premature expulsion of the uterine contents. As regards the source from which this fluid originates, we have no satisfactory evidence; authors vary in opinion concerning it, some considering it to be the result of an uterine dropsy, others to a transudation of the amniotic fluid through the membranes, some again to a rupture of the allantois, or rupture of the chorion and caduca, etc. Most generally, the woman goes on to the full term of utero-gestation. Where there is danger of miscarriage, the bowels should be kept in a soluble condition by mild laxatives or injections, the patient should be enjoined to keep in a state of repose, and sedatives must be administered, among which I prefer the officinal compound powder of Ipecacuanha and Opium. As soon as any danger of premature labor has passed away, the patient should take the compound syrup of Partridgeberry, for the purpose of imparting tonicity to the reproductive organs, in connection with chalybeates if anæmia be present. When a symptom of this character attacks a pregnant female, the practitioner should be careful to ascertain the condition of the bladder, as not unfrequently a discharge of urine may be mistaken for it.

Not unfrequently the uterus is attacked with *spasmodic action* — the organ may be felt rapidly moving from side to side, with frequent convulsive movements, and will speedily induce premature labor if not relieved. I find it the best treatment in these cases, to evacuate the rectum by enema, after which inject a fluidrachm or two of Antispasmodic tincture mixed with a little tepid water, into the rectum, and cause it to be retained there as long as possible, while internally the patient may take a teaspoonful or two of tincture of Gelseminum, with ten or twenty drops of tincture of Black Cohosh. Anodyne liniments may also be rubbed on the abdomen.

The impregnated uterus is sometimes attacked with *rheumatism*, commonly produced by the same causes which give rise to rheumatism of other parts. It is most common to those of a rheumatic diathesis, and is frequently a metastasis of the pain from some other part. The symptoms are pain, augmented sensibility of the uterus, which may be limited to only a part of the organ, or extend over the whole of it, no contractions, pressure often increases the pain, which may extend into the loins, groins, and thighs, or which may suddenly be translated to some other part of the system. There is a constant desire, or tenesmus, to evacuate the bladder and rectum. To remove this condition, dry-cupping may be employed over the lumbar and sacral regions, with sinapisms to the wrists; or, when the patient is subject to rheumatism, the sinapism should be applied to the parts in which it is most commonly seated. The bowels should be kept regular, and internally a pill composed of hydro-alcoholic extract of Black Cohosh one grain; Quinia half a grain; and extract of Aconite one-eighth of a grain, may be administered every one, two, or three hours. In many cases, diaphoresis, induced by the administration of compound tincture of Virginia Snakeroot, will be followed by prompt relief. Benefit will frequently follow the exhibition of tincture of Gelseminum eight parts; tincture of Aconite one part: dose, half a fluidrachm, repeated every hour or two, until the peculiar influence of the remedy is obtained. This will be found a valuable agent in all rheumatic and neuralgic affections.

The *movements of the fetus* in utero, are sometimes very *violent*, or *turbulent*, not only occasioning alarm to the mother, but much uneasiness, a sense of sickness, with general nervous agitation, sleeplessness, febrile symptoms, and often local pain. This may be owing to an irritability of the nervous system, or to some preternatural susceptibility of the uterus. It may be removed by an attention to the bowels, and the administration of a combination of Cypripedin, Scutellarin, and Cimicifugin; the compound syrup of Partridgeberry will frequently prove beneficial; and when obstinate, a few doses of the compound powder of

Ipecacuanha and Opium may be given. However, the practitioner should bear in mind, that narcotics should be employed as seldom as possible, during pregnancy, on account of their deleterious influence upon the nervous system of the fetus. Cimicifuga, Caulophyllum, Cypripedium, Scutellarin, Valerian, Lupulin, Symplocarpus, etc., should be used in preference.

Dropsy of the ovum, usually takes place during the early months, and may be suspected by an unnaturally great increase in the size of the abdomen, which comes on suddenly, thereby differing from the gradual enlargement in ascites, and which is rendered still more certain when the pregnancy is positively determined. It is frequently, however, very difficult to form a correct diagnosis, and some of our oldest and most experienced practitioners have been mistaken in relation to it. Abortion is the common result, the fetus generally perishing before this accident occurs, especially if the collection of fluid is great; and should it be born alive, it seldom survives a few days, or weeks at farthest. The only treatment, in this affection, is strict attention to the health of the female, and an absolute avoidance of the operation of paracentesis; for no practitioner is justified in performing this operation on a female who affords the smallest possible suspicion of pregnancy; at least until a sufficient time has elapsed for its determination by the positive signs, as revealed by auscultation, ballottement, etc. When the quantity of fluid is enormous, giving rise to serious consequences, the propriety of inducing premature labor by evacuating the amniotic liquid, may then be considered. Hemorrhage and abortion will be treated of in the following chapters.

The accidental concomitants of pregnancy, are *hernia*, *tumors*, *syphilitic affections*, *calculus*, *deformed pelvis*, and *extra-uterine pregnancy;* the latter two have already been treated upon, the others require no especial consideration at this place; they will be again referred to under the head of labor. The treatment for syphilitic affections will be the same as pursued under other circumstances, independent of pregnancy.

CHAPTER XIX.

HEMORRHAGE AND ABORTION.

WHEN the fetus is capable of continuing its existence, indepen any uterine connection, it is said to be *viable;* and the perio viability, though not precisely fixed, is generally admitted at the commencement of the seventh month. There are, however, a few instances on record where children, born as early as the commencement of the sixth month have been reared, but these may be considered as the exceptions to the general rule. A fetus may move at birth, but this does not constitute viability. In cases where it is non-viable, or incapable of sustaining an extra-uterine existence, that is, previous to the seventh month, and is expelled from the uterus, owing to any cause whatever, an *abortion* is said to have taken place. Its expulsion at any time between the seventh month and full term, is a *premature delivery;* and the term *miscarriage* is popularly applied to either of these, indiscriminately, and generally conveys an idea of loss of offspring previous to the ninth month.

As hemorrhage and abortion are intimately related, being generally dependent on, or connected with each other, I will consider them under one head. *Hemorrhage* may take place at any period of pregnancy, and is owing to a greater or less detachment of the ovum from the uterus, and the more extensive the detachment, the greater is the necessity for, or disposition to abortion. In the earlier months, life is seldom endangered by hemorrhage, in consequence of the smallness of the uterine bloodvessels, which do not admit of a large and rapid discharge of blood; but in the latter months, where these vessels have become much augmented in size, there is always danger from the hemorrhage which may then occur. It should be stated here, that women, laboring under hemorrhage in the earlier months, are occasionally lost, the flooding obstinately resisting all treatment; this is more usual with debilitated or anæmic individuals, especially those who have had previous discharges, with large loss of blood.

Abortion, may be spontaneous, accidental, or designed, and may occur at any time prior to the seventh month, but more frequently about the third month, and generally at a period coincident with menstruation; this is undoubtedly owing to the delicate connection existing between the ovum and uterus at this time, whereby a separation of the former may ensue more readily from even slight causes than in the latter months, when this connection is more persistent. Abortion is not usually a serious accident, as many females abort several times, successively, and few women who bear offspring pass through their menstrual life without aborting one or more times. The principal dangers are from excessive hemorrhage, or the constitutional injury inflicted by a series of successive abortions. The *causes* of this accident are numerous, and have been divided into *constitutional*, or depending upon the condition of the maternal health; *ovuline*, or attributable to some disease of the ovum; *uterine*, or originating from an abnormal state of the uterus and its appendages; and *accidental*, or owing to circumstances not immediately connected with the condition of the uterus, ovum, or mother.

No particular class of females are especially liable to abortion; it occurs among those who enjoy the idle, sedentary, luxurious habits of fashionable life, and among those who are obliged to earn their daily subsistence by hard labor; the most robust may abort as well as those of a delicate and nervous disposition; though it may, probably, be more frequently observed among those who neglect an attention to the rules of hygiene. Authors state that plethoric females, those who are nervous or irritable, or extremely susceptible to external impressions, and those of indolent habits, abort more frequently than others; it has likewise been stated that abortion may occur as an epidemic. The *constitutional* causes are tuberculous diseases, as scrofula, phthisis, and recent cutaneous affections, epilepsy, hysteria, abdominal tumors, leucorrhea, diarrhea, dysentery, constipation, strangury, or, measles, scarlatina, typhoid fever, small-pox, and other acute diseases. Syphilis is likewise a common cause. Among these causes, when they occur, probably, syphilis, epilepsy, small-pox, and scarlet fever, are the most certain. Ascarides, piles, or other diseases of the rectum, as well as of the bladder, by the irritation they communicate to the uterus, may likewise become causes.

Females, during pregnancy, or even after a recent confinement, should never be vaccinated, because in either case it exposes them to great hazard; this is a point to which especial attention should be paid, not only on account of the abortion which would very probably follow, in the first condition, but, in either, violent fever or inflammation of the veins, might be produced, resulting in death.

The *ovuline* causes are numerous; thus, the fetus may be affected with the parental disease, as measles, small pox, scarlatina, etc., which may either occasion its death, or cause its attachment to the uterus to become so delicate as to render abortion unavoidable. Syphilitic disease may be communicated to the ovum by the male parent, as well as the female; and a seminal fluid vitiated by debauchery, or having its vitality enfeebled by age, may also give rise to an unhealthy embryo, the result of which will be an abortion. Atrophy, also hypertrophy of the placenta, may so debilitate its connection with the uterus as to become a cause of this accident. An effusion of blood between the placenta and uterus, termed by M. Cruveilhier *placental apoplexy*, may separate the placental connection, and give rise to abortion; placentitis, hydatids, or fatty degeneration of the placenta, rupture of the umbilical vein, etc., will also produce it. Whenever the fetus is dead, from whatever cause, it becomes a foreign body, excites uterine contraction, and must inevitably be expelled, though frequently some time may pass between its death and expulsion. Other diseases of the embryo or its appendages may likewise occasion abortion. Indeed, it is supposed, that the most common causes of this accident, are those referable to the condition of the ovum.

Among the *uterine* causes are, prolapsus, retroversion, anteversion, adhesions, uterine irritability, uterine congestion, fibrous tumors, polypus, cancer of the cervix, diseases of the tubes or ovaries, ulceration of the cervix, corroding ulcer, etc. Madam Boivin found that, among a great proportion of those females who habitually aborted at a regular period of utero-gestation, dissections revealed uterine adhesions to the bladder, rectum, or other neighboring organs; of course, if these adhesions are considerable, there can be but little expectations of cure.

The *accidental* causes are falls, blows, coitus, severe exercise, lifting heavy weights, rough motion on horseback or in carriages, or violent concussion of the body from jumping; and the membranes of the ovum may be so frail as to rupture upon a very slight compression of the uterus, occasioned by coughing, sneezing, extracting a tooth, or straining at stool. Abortion is also occasioned by emesis, drastic purgation, tight-lacing, terror, grief or excess of joy, together with the criminal means frequently employed for this purpose. It is unnecessary to enter into a detailed relation of these causes, as they can seldom be obviated by the practitioner, whose principal efforts will be directed toward preventing their results from becoming dangerous. Some women abort from the slightest causes, while with others again, the most serious accidents produce no influence of this kind. It is stated that abortion has been caused by the mere smelling of a pungent odor, but I presume such instances must be very rare. Among newly-married persons, abortions frequently occur from the abuse of coition, and this will likewise prove a very fertile cause of the accident among child-bearing females at any period, especially when they have some uterine displacement, or disease. As a general rule it may be observed, that when the ovum is healthy, and its placental connection is firm, the production of abortion in a pregnant female will be found very difficult to effect, except it be attempted by some mechanical means, when it will be apt to assume its more serious character; but if the ovum be diseased, the tendency to abort will be in proportion to the influence of the disease upon it, and its placental connection with the uterus.

Abortion is undoubtedly produced by continued lactation during pregnancy; and with many females, conception, as well as menstruation, is retarded while the child continues to suck. But whenever the menses appear during suckling, the child should be immediately weaned, both for its own advantage as well as that of its mother; and the same course should be adopted when pregnancy happens. Frequently, a threatened abortion may be checked, and the female be enabled to reach full term, by immediately weaning the child upon the first appearance of pain or bloody discharges.

The *symptoms* of abortion are very much modified by the causes which produce it, and the period of pregnancy at which it occurs. If it happens during the first days of pregnancy, it is accompanied by little or no pain, and is often mistaken by the female for a difficult menstruation; and the ovum which usually passes away entire, and accompanied by a greater or less amount of blood, is looked upon merely as a coagulum or clot. When the pregnancy is more advanced, and especially when the abortion proceeds slowly and gradually, various premonitory symptoms may present themselves, as a feverish or irritable condition of the system, loss of appetite, nausea, cold extremities, swelling of the eyelids, with lividity, mental depression, intermittent pains in the loins, a sensation of weight about the vulva, frequent desire to urinate or defecate, and flaccidity of the breasts; the pains continue to increase in frequency and force; they extend over the abdomen, running toward the coccyx, and finally assume the characters of true uterine contractions. A sanious and bloody vaginal discharge takes place, and, as the pains continue, the dilatation of the os uteri progresses, the membranes protrude, become ruptured, the liquor amnii escapes, and, sooner or later, the ovum, either entire or not, is expelled. As all these symptoms, with the exception of rupture of the membranes, may occur in pregnancy without any subsequent abortion, the practitioner must be guarded in his diagnosis, unless he knows positively that the fetus is dead.

Most frequently, however, there are no precursory or constitutional symptoms; the first sign being the hemorrhage, which is more or less abundant, and is followed by a cessation of the fetal movements, pains, and expulsion of the fetus. If the fetus is dead, or the liquor amnii has been discharged, abortion will almost certainly take place, sooner or later, though no time can be positively determined after the death of the fetus, for its expulsion.

Between dysmenorrhea and abortion there is considerable resemblance in the character as well as the seat of the pains; both are intermittent, and both cease after expulsion of the uterine contents; hence, it becomes the accoucheur to proceed cautiously in forming his *diagnosis*. He must first endeavor to ascertain whether pregnancy has taken place; failing in this, he must inquire into the character of the previous menstruations, whether they were painful, accompanied with much hemorrhage, etc. And he should never fail to examine all the discharges, especially the clots, if they have not been thrown away, breaking them down between the fingers, and among which he may discover the entire ovum, or only a portion of it; and every practitioner should perfect himself in a knowledge of this kind, not only by an examination whenever the opportunity occurs, but also by procuring, if possible, ten or twelve specimens of ova at various periods of pregnancy, and preserving them, so as to accustom the eye to a familiarity with them. If he ascertains that the former menstruations were healthy, and that between the present difficulty and the last menstruation, one or two months have been passed without any discharge, these are strong grounds for suspecting abortion; if pregnancy exists, abortion is undoubtedly in progress. The blood in dysmenorrhea is menstruous, while that in abortion is sanguineous, and escapes in larger quantities than is usual to the catamenia. The finger should likewise be introduced into the vagina for the purpose of ascertaining the condition of the cervix, and if its orifice be found sufficiently dilated to admit the end of the finger, the diagnosis becomes more certain.

The diagnosis of abortion is more positive as the period of utero-gestation advances, because the development of the uterus can then be readily ascertained, the pains will be more violent, the hemorrhage more abundant, and the dilatation of the os uteri more easily detected. After the fifth month the death of the fetus may also be more positively ascertained by auscultation, which will fail to detect the sounds of the fetal heart, and if it has been dead for a few days, there will be found an emaciation and flaccidity of the breasts, a diminution in volume of the abdomen, with weight in the hypogastrium, dragging sensations about the loins, and cessation of the fetal motions which were previously observed by the female. In the early months of pregnancy, if nausea, vomiting, or other sympathetic irritations connected with this condition, and which are present with a patient, become suddenly suspended, it affords grounds for suspicion of approaching abortion.

The *prognosis* of abortion varies according to its cause, as well as the period in which it occurs; females who abort are always exposed to more danger than when delivery takes place naturally at full term. In a few cases, death takes place during the accident, but more commonly no immediate fatal effects happen, though they are very apt to ensue as secondary results, being the consequence of some chronic disease of the uterus, ovaries, etc., produced by the abortion. Females at full term are more subject to acute maladies, which often prove immediately fatal, while the serious results of abortion more commonly manifest themselves at a remote period; yet grave consequences may occur speedily under either of these conditions. Abortion is very generally unfavorable to the fetus, because its expulsion happens during its stage of non-viability, and its death must inevitably take place; or, the abortion may have been determined by its death. In this latter case, the fetus, acting as a foreign body, excites the uterus to contractions; but this effect may not take place for weeks and even months after its death.

Abortion occurs with more difficulty, and is attended with more danger, after the second month of pregnancy than before, on account of the increased size of the ovum, and the unfavorable condition of the cervix to dilatation; and the more advanced the pregnancy, the greater is the danger from hemorrhage. Probably, abortions occurring during the third and fourth months of pregnancy, are, as a general rule, more dangerous than at any other period. If the hemorrhage is profuse, abortion will be very apt to follow, though the practitioner must bear in mind, that large and frequent hemorrhages may occur, and yet pregnancy continue to the full term. If the pains occur at regular intervals, with dilatation of the os uteri, and protrusion of the membranes, the abortion almost always follows; and if the membranes be ruptured, it will certainly occur; the death of the fetus will likewise positively determine it, though a few instances are related of an opposite character.

If the abortion be produced by constitutional, accidental or mechanical causes, it is usually more violent or alarming in its results, than when owing to the uterine or ovuline. When it occurs during acute attacks, as measles, erysipelas, scarlatina, small-pox, typhus, etc., being the result of the severity of the attack, it is very apt to prove fatal, especially when it takes place before a mitigation or cure of the acute disease has been effected. When produced mechanically, the principal danger is from hemorrhage, peritonitis, or metritis. Usually, the more slowly the abortion comes on, the less danger is there to fear from hemorrhage, though the constitutional effects are more to be dreaded, than when it is accomplished with rapidity. Previous abortions always exert an unfavorable influence upon subsequent pregnancies, predisposing to a similar accident, and which, of course, requires the especial attention of the practitioner.

The ovum, in an abortion previous to the third month, is usually expelled entire, but after this period it commonly proceeds as at full term, the liquor amnii being first discharged, followed by the embryo, and sooner or later by the placenta. At the third and fourth months, the placenta has considerably augmented in size, and has likewise formed close adhesions with the uterus; and this latter organ, though it may have acquired a degree of contractile power sufficient to expel the ovum, does not possess the contractility of tissue as developed at full term, and is frequently incapable of overcoming the attachment existing between it and the placenta. In an abortion at this period, a partial evacuation of the uterine contents, is very apt to be followed by a closure of the os uteri, and a cessation of the symptoms, leading the practitioner to believe that the abortion has happily terminated; but after several days the hemorrhage, generally preceded and accompanied with pains, again appears with increased severity, and if the cause be not removed, the patient dies. The cause, in this instance, is a retained placenta and membranes; the utero-placental adhesions having been overcome, hemorrhage, and sometimes copious hemorrhage, follows the separation of the placenta from the uterus, which remains detached in the uterine cavity, irritating the uterus and preventing its complete contraction, thereby promoting an increased hemorrhage, and causing a fatal termination, if the patient be not relieved by art. And whenever hemorrhage occurs, several days subsequent to an abortion, the practitioner should always suspect the presence of the placenta and membranes within the uterus, without regard to the statements that may be made to him, affirming that these have been expelled. He should at once make a vaginal examination, when he will probably find a partially dilated os uteri, with a portion of the placenta protruding. Should the placenta be only partially detached, the os may be slightly dilated, but without protrusion of the placenta, depending however upon its situation and extent of separation. Occasionally, the placenta decomposes, the uterine discharges become fetid, absorption of the putrid matter takes place, and an irritative fever ensues, requiring all the skill of the practitioner to overcome, or to avert its fatal effects. Putrefaction of the dead fetus takes place only when the membranes are ruptured, which admits the air into the cavity of the uterus; decomposition without putrefaction ensues when the membranes are entire. Absorption of the placenta has been observed, both after an abortion, as well as after a natural accouchement. Sometimes an effusion of blood into the placenta may occur, and by imparting to it a kind of organization, produce what are known as "fleshy moles."

The TREATMENT varies according to the symptoms which are presented, the principal indications being, to prevent the abortion if possible, and when this cannot be effected, to assist the expulsion of the uterine contents, and likewise to remedy any subsequent accidents. In all cases of abortion, the practitioner should examine the condition of the cervix, except in instances where the death of the fetus has been positively ascertained; if it be but slightly dilated, unfavorable to the speedy expulsion of the ovum, and if the hemorrhage be not too threatening, an attempt may be made to check its further progress; but if it be dilated and attended with considerable hemorrhage, means must be adopted which will favor its speedy expulsion. In a great number of cases whether abortion ensues or not, all the treatment required will be rest in the recumbent position, perfect quiet, cooling drinks, and light diet, with an occasional dose of the compound powder of Ipecacuanha and Opium, say four or five grains repeated every two, three, or four hours, for the purpose of subduing the pains. But where this course does not speedily effect a mitigation of the symptoms, a blister should be applied over the sacrum; indeed, I seldom attend a case of threatened abortion in its early stage, without having a blister or sinapism placed over this part. If the blister be employed, mucilaginous diuretics should be administered internally to overcome any tendency to strangury, as an infusion of equal parts of Parsley and Marshmallow roots. Should any displacement of the uterus, or other affection exist, it must be treated as named hereafter. Nauseating with a preparation composed of three or four parts of the tincture of Lobelia, and one of tincture of Opium, has been recommended and successfully employed in some cases, but I deem it an inferior method to the one above named; although it may be used should that fail. Care is required not to cause emesis, which might render the abortion inevitable. The administration of Stramonium seed has been highly spoken of, but I have never seen their action in such cases, and can therefore say but little about it. If the hemorrhage be slight, it may not require any especial attention, but when it is considerable, efforts should be made to check it. For this purpose, cloths wet in cold vinegar and water, or ice may be applied to the hypogastrium and pudendum; but the application of ice within the vagina, or cold vaginal injections, recommended by some authors, should be used with great caution, lest they produce the accident we are attempting to avert. In connection with these, internal means must be used, a few drops of the oil of Erigeron, or oil of Erechthites may be given, in mucilage or on sugar, every ten, thirty, or sixty minutes, according to the severity of the hemorrhage; or a powder composed of burnt Alum and Sulphate of Iron, three grains, Capsicum one grain, may be administered as often as the urgency of the symptoms demand; the burnt Alum and Sulphate of Iron, form a valuable hemostatic, and may be made by mixing together two parts of Sulphate of Iron and one of Alum, and exposing them to heat in a stone or clay dish, until the mixture assumes a reddish color. Other astringents may be employed in the absence of those named. An agent in common use as a hemostatic, is powdered alum and nutmegs; Prof. Meigs recommends it in the proportions of five grains of the former to one of the latter as a dose, to be repeated every half hour or hour.

Should these means fail to arrest the hemorrhage, and there is no doubt on the mind of the practitioner, but that the expulsion of the ovum must take place, the tampon or plug should be employed. This consists of pieces of linen cloth, muslin, silk, etc., about three or four inches square, which are to be separately introduced into the vagina, until it is completely filled and distended; these are to be kept in place by a napkin or bandage, and may be allowed to remain for six or twelve hours, but never to exceed twenty-four. Sometimes sponge is used, but I think it inferior to the pieces just referred to. It must be especially borne in mind by the practitioner, that the tampon is never, under any circumstances, to be used after the fifth month of pregnancy; because, the uterine capacity having become much augmented, its cavity may become distended with blood or coagula, and cause a fatal result. Previous, to the fifth month, however, it is incapable of containing an amount of blood sufficient to prove fatal from a concealed hemorrhage. Upon the removal of the tampon, a coagulum may be observed attached to its upper part, in the center of which the ovum, or its remains will generally be found. Should the presence of the tampon induce dysury, the bladder must be evacuated by means of a catheter; and during the whole treatment the female should be kept in the recumbent position, and not allowed to arise until all danger from hemorrhage is over. The tampon ought never to be used when there is any possibility of checking the abortion, as it almost always increases the tendency to abort, in consequence of the irritation of the cervix produced by its presence, having extended to the fundus; beside, the external discharge of blood being suppressed, it continues to be effused internally, gradually separating the ovum from the uterus, until it finally passes off, surrounded with a compressed coagulum.

Among females who habitually abort in the early months of pregnancy, they should, after the symptoms of abortion have been removed, be advised to remain in the horizontal position, avoiding all fatigue and violent exertion, until the uterus has risen above the superior strait of the pelvis. The employment of the lancet in cases of abortion, is recommended by some authors, but I cannot perceive its utility; the detachment of the placenta from the uterine wall, which is the cause of the hemorrhage, can not certainly be remedied by a loss of blood from some other part of the system, for in all the cases which I have witnessed treated by blood-letting, the separation continued to progress with augmented hèmorrhage, and the only result gained was a degree of debility and disposition to disease, on the part of the female, probably greater than would have resulted had the use of the lancet been omitted. It is true, that in consequence of the prostration of nervous and muscular force effected by its use, it may overcome rigidity of the cervix, and favor the dilatation of the os uteri, when the fulfillment of these indications is desired, but then we have remedies which produce the same results without disposing a part or all of the constitution to any of the after disastrous consequences so common to blood-letting, as, Lobelia, and still better, the tincture of Gelseminum, from the relaxing influences of either of which, the patient will speedily recover. I am aware that bleeding in many cases may arrest or modify the expulsive contractility of the uterus, but it is effected at a great expense to the constitution of the patient, and is by no means a safe or desirable method of treatment; Opium, either alone, or combined with Lobelia, Gelseminum, or Scullcap, will not only produce the same results, but will succeed in cases where bleeding fails. For the purpose of equalizing the circulation, it has been advised by some accoucheurs to bathe the lower extremities of the female, in warm water; with some patients this course may be attended with benefit, but it should always be employed with caution, as among many women it will be found to facilitate the abortion; it is only in hemorrhage after the expulsion of the ovum where much advantage will be derived from this local bathing.

If by the means employed the abortion is not prevented, or if it be so far advanced that no hope for checking it can be reasonably entertained; the pains increasing together with the hemorrhage, the os uteri gradually dilating, and the ovum being within reach of the finger, all that the practitioner can do is to patiently await the efforts of nature, and carefully watch the hemorrhage; as a general rule, any artificial interference is highly improper, and might give rise to serious consequences. The practitioner must be very careful not to rupture the membranes in the early months, for the purpose of facilitating expulsion, as it is always desirable that the ovum be expelled entire, for when the membranes are retained after the discharge of the fetus, there is danger from hemorrhage; and when, in cases of such retention, it is found that the contractions of the uterus are insufficient to separate and expel the membranes, agents may be administered which will promote these contractions, as Black Cohosh root, Blue Cohosh root, or Ergot; or these agents may be combined in equal proportions. If this does not produce the desired effect, and the hemorrhage continues unabated, it will be proper for the practitioner to introduce a finger within the canal of the cervix, as far as possible, then bend it so as to resemble a blunt hook, and in this way remove the membranes, and in doing this it may become necessary to introduce the whole hand into the vagina; or, a wire blunt-hook, which will admirably answer the purpose, may be made, by bending a piece of fine wire so as to form two parallel strips nearly in contact with each other, the curved end of which is to be again bent so as to form a hook; this may be introduced into the uterus, whenever hemorrhage is owing to retained membranes, for the purpose of removing them. Other instruments have likewise been recommended for this purpose, as Bond's placental forceps, and Dewees' placental hook. But in the introduction of the finger, or any of these instruments into the canal of the cervix, no force must be employed, too much care and gentleness can not be observed; no attempts whatever should be made, to effect dilatation, nor should these means be employed at all until the cervical canal has become cylindrical and sufficiently open for their free intromission. And as the development of the uterus previous to the fifth month is not such as to warrant any fears of a serious internal hemorrhage, the tampon may be used, in conjunction with the other means, to check flooding, if circumstances prevent the removal of the membranes. The introduction of the tampon is sometimes attended with such disagreeable and painful sensations that the patient can not endure its presence for even ten minutes; in such cases, as well as in cases where it does not check the hemorrhage, the evacuation of the uterine contents must be promoted as soon as possible. It may be proper to remark here, that when the hemorrhage is such as to threaten the life of the mother, every means must be employed to arrest it, even should the means effect the death and expulsion of the fetus, as the safety of the mother always demands such sacrifice. When the death of the fetus has occasioned the abortion the hemorrhage is not generally excessive.

In the more advanced stages of pregnancy, when in consequence of excessive hemorrhage or other cause it becomes necessary to facilitate the expulsion of the fetus, the membranes may frequently be ruptured with advantage, because at this period, the uterus has increased in size sufficiently to receive two or three fingers, or even the whole hand, should it become necessary to remove a retained placenta. And the extraction of the placenta should always be effected, when the abortion occurs at a period of utero-gestation, in which the uterus will permit the introduction of the hand within its cavity. Other means may likewise be employed to favor the expulsion, as Blue Cohosh root, Black Cohosh root, or Ergot, together with cold applications to the pubes and hypogastrium, to aid in arresting the hemorrhage. At this period I usually prefer as an internal hemostatic, the essence of Cinnamon, of which from half a fluidrachm to a fluidrachm may be be given every ten, thirty or sixty minutes, as the urgency of the case requires, in a wine-glass of sweetened water; ten or fifteen drops of Laudanum may be added to each dose, in case the pains are very severe. After the embryo and its membranes have passed away from the uterus, should hemorrhage still continue, it must be treated in the same manner as recommended for flooding after delivery at full term.

A weak solution of Sulphuric Acid has been frequently employed in hemorrhages occurring during pregnancy, as well as after delivery, with decided benefit. It is exhibited as a vaginal enema, ten or fifteen drops of the acid being added to three or four ounces of warm water. Care should be taken, however, not to employ it when it is desired to check the abortion. Many persons use this injection with the criminal intention of procuring an abortion.

In cases of hemorrhage occurring several days after the abortion has apparently terminated, and which, as previously stated, are owing to a retention of the placenta and membranes, the wire blunt-hook may be slowly and carefully passed within the canal of the cervix, and the membranes extracted by means of a gentle manipulation; if this can not be accomplished, the practitioner will have to contend with the effects of putrefactive absorption. Putrefactive decomposition may be known by a fetid lochial discharge, and absorption of the putrid matter gives rise to an irritative fever which may prove dangerous. The fever must be treated upon general principles, being careful to support the strength of the patient; and the uterus must be frequently syringed with a tepid astringent infusion, as of Golden Seal and Geranium, for the purpose of removing the putrefied material as soon as it forms. If the os uteri should be closed so as to prevent the introduction of a canula for this purpose, the practitioner will have to limit his attempts to mere vaginal injections, in which he may employ the above astringent infusion or a dilute solution of Chloride of Soda. In several cases of fever from putrefactive absorption, in which it was impossible to syringe the uterus, as above advised, I have succeeded in preventing any serious consequences by administering, in connection with the general treatment, an infusion of two parts each of Blue Cohosh root and Unicorn root (*Aletris far.*), with one part of Wild Indigo root. Infuse one ounce of the mixture in two pints of water, and give a tablespoonful every two, or three hours, or even oftener, if the symptoms are urgent. I prefer the infusion, in these instances, to the concentrated preparations of the articles. Peruvian bark in Port wine has also been used in a few cases with apparent benefit.

After an abortion, especially in advanced pregnancy, a bandage should be applied around the abdomen, the same as after ordinary labor, and the patient should be kept for several days in a state of rest; if there be much exhaustion from loss of blood, the diet must be similar to that recommended in uterine hemorrhage, or flooding after labor at full term. A lochial discharge, as well as secretion of milk is most commonly present, after abortion in the advanced stage of gestation.

The *sequelæ*, or after consequences of abortion, are irritative fever, metritis, peritonitis, phlebitis, ulceration of the cervix, anæmia, leucorrhea, menorrhagia, dysmenorrhea, organic disease of the uterus, sterility, or phthisis.

When an abortion has once taken place, it is very liable to recur during the following pregnancy, and to prevent the occurrence of which, the practitioner should endeavor to ascertain its cause, and remove it, if possible, by the appropriate treatment. Should it be owing to tumors, diseased ovum, or other intra-uterine diseases, treatment will be of little avail; though in these cases the internal use of alteratives, uterine tonics, proper diet, exercise, etc., may be adopted with a faint hope that good may follow. If the uterus be displaced, it must be restored to its normal position; should ulceration of the cervix uteri be a cause, it must be treated by applying locally Nitrate of Silver, solution of Sesquicarbonate of Potassa, solution of Sulphate of Zinc, etc.; the application to be made by means of a speculum. The patient must likewise be kept in a state of rest, and if treated during pregnancy, no vaginal injections must be used. Dysmenorrhea is frequently a cause of abortion, and when present, the functions of the uterine system must be attended to, administering uterine tonics, and pursuing the means generally recommended in Eclectic teachings to remove the difficulty; and so in all other uterine derangements. If the abortion is owing to a syphilitic taint of the system, this may be remedied by the use of the officinal compound syrup of Stillingia, which I am in the habit of preparing by adding to one pint of the syrup, four drachms of the Iodide of Potassium and three fluidrachms of the saturated tincture of Sheep Laurel (*Kalmia lat.*); of this, the dose is one fluidrachm in half a gill of water, to be repeated three or four times a day. The bowels must be kept regular, the diet must be nutritious, avoiding fats and acids, the surface of the body must be frequently bathed with a weak alkaline solution, and too much exercise must be prohibited; if the male parent is contaminated with the disease, but little benefit can be expected unless he is also placed under proper treatment. The administration of mercury, so highly recommended by some authors, is of no utility, as this agent will not only effect no cure of the disease, but has a strong tendency to destroy the vitality of the fetus, and thus add to the already existing cause of abortion. Any other disease with which the patient may be affected, whether general or local, must, if possible, be eradicated by the appropriate remedies, which may be employed not only during the interval between pregnancy, but likewise when this condition is present.

Anæmic or chlorotic patients should be treated with vegetable and chalybeate tonics; those who are plethoric, require light and moderate diet, exercise, regularity of bowels, and depletion by diuretics; and coition should be very moderate until pregnancy occurs, during which it must be positively prohibited. If the patient resides in a miasmatic district, usually so called, a removal will in many instances be followed with benefit; if she be giving suck when pregnancy occurs, the child must be weaned; if there be any vesical or rectal irritation, piles, or a constipated condition of the bowels, these may be overcome by an attention to diet, aided with laxatives, anodyne and mucilaginous enemata, quiet, and an avoidance of all active medicines. As habitual abortions usually occur at a regular period of pregnancy, the patient should at this period be kept in the recumbent position, upon a hard mattress, in a cool room, and be otherwise treated according to the peculiarities or indications of her individual case; and which treatment should be perseveringly pursued until the aborting period has passed by.

When habitual abortion obstinately resists our endeavors to remove it, it will ultimately destroy the constitution of the patient; and it therefore becomes necessary on her part to pursue a rigid and self-denying course. The indications are, firstly, to avoid pregnancy, until the functions of the reproductive organs have been restored to a normal condition; and secondly, to effect this restoration. The only method by which the first indication can be fulfilled is absolute and positive discontinuance of sexual intercourse for a year or longer—or for such a length of time as may be required to effect a healthy condition of the generative functions. I am aware that various other means may be suggested, or pursued to prevent pregnancy, but, in the cases under consideration, it must be especially borne in mind, that not only is an avoidance of this condition required, but it is imperatively demanded that the sexual organs be maintained in a state of quiet, entirely free from all excitement, and which can only be effected by rigid abstinence.

The second indication is to be accomplished by bestowing a careful attention toward both the uterine and general systems, employing tonics, alteratives, and such other measures as may from time to time be required. The tonics which I have found more commonly beneficial are, the officinal compound wine of Comfrey, the officinal compound syrup of Partridgeberry, or, a pill composed of alcoholic extract of Unicorn root, Caulophyllin, Sulphate of Quinia, and hydro-alcoholic extract of High Cranberry bark, of each, equal parts; divide into pills of three grains each, and administer three, four, or five daily, as may be necessary; indeed, the vegetable uterine tonics, generally, may be employed with advantage. The agents which I term uterine tonics, and which are described in the Am. Eclec. Dispensatory, appear to exert an especial healthful influence upon the uterus, but of their peculiar modus operandi, I am free to confess my ignorance. In connection with tonic remedies, alteratives will be found an important part of the treatment. The compound syrup of Sarsaparilla, the compound syrup of Stillingia, or other officinal syrup, either with or without the addition of Iodide of Potassium, may be advantageously employed; but I have derived more benefit in these cases from the following preparation, than from any other which I have prescribed: Take of saturated tincture of Black Cohosh root, fourteen fluidrachms; tincture of Iodine, two fluidrachms: mix. Of this tincture give fifteen drops in a fluidrachm or two of water, three times a day; this may appear to be a small, or not very active dose, yet its influence will be found prompt and permanent.

In conjunction with this treatment, the bowels must be kept in a soluble condition by the use of mild laxatives, so given as to produce one, but not over two alvine evacuations, daily, approximating as nearly as possible to the natural healthy discharges; and for this purpose I prefer the powder of Rhubarb and Bicarbonate of Potassa, heretofore referred to, under the treatment of vomiting during pregnancy; this may be omitted, occasionally, and cold or tepid enemata employed, as will be found to suit each particular case. Active purgation is invariably to be prohibited, except in plethoric patients, when it may be resorted to every week or two, if not contra-indicated. Bathing the surface daily with cold or tepid water, and once a week with a weak alkaline solution, and drying with considerable friction, will materially assist in the restoration to health, by bringing about a normal condition of the skin, the functions of which will be found more or less impaired in these cases; the shower-bath has also been advised, either of rain-water, or salt-water, and where it is applicable it will usually prove beneficial; its temperature should range between 75° and 85°, and the best time of using it, is upon rising in the morning. Moderate exercise will be found indispensable, and an avoidance of all indolent habits, as lying in bed late in the morning, lying down after a meal to sleep, sleeping on feather-beds, etc. The diet should be light but nutritious, using tender fowls, meats, etc., but always avoiding fats and acids; and very weak patients may use Port wine, Porter, or other suitable stimulants, in moderate quantity during the dinner meal. Occasionally, a change of air will prove serviceable. All bathing must be omitted during menstruation. By a perseverance in this course for one or even two years, the most obstinate cases of habitual abortion, when not owing to uterine adhesions, may be cured; and it may be proper to remark, that should pregnancy occur shortly after dismissing the patient as cured, it is very necessary that close attention be bestowed upon that condition, until five or six weeks have passed beyond the previous aborting period, in order to promote the certainty and permanency of the cure.

Before leaving this subject, I wish to refer to two things which may occasion some trouble to the practitioner in the treatment of abortion; the first is, the difficulty in prevailing on some females to keep quiet, and confine themselves to the recumbent position for a sufficient length of time. Not feeling any sickness, nor suffering from any pain, the patient will be apt to treat the advice of her physician, in this matter, very lightly, unless it is especially urged upon her, explaining to her the consequences of a different course of action, and the advantages attending its observance, among which may be named the diminution of the tendency to abort, and strong probability of its permanent cure, when the habit has been overcome in any one pregnancy. The practitioner cannot be too particular in regard to this matter. The second point, is relative to the decided objections which are frequently made to vaginal examinations. When a female, during an abortion, objects to an examination of this kind, and the symptoms are not very urgent, the physician will treat the case as well as circumstances will permit; but when the hemorrhage is great, and the serious consequences that may happen from a persistence in the objection have been explained, without effecting any change in the will of the patient, it would be improper for the practitioner, as far as his own reputation, alone, is concerned, to assume the whole responsibility of the case. He will, therefore, not manifest any irritation, nor abruptly leave the patient, but will state to the friends, or the patient, that the case has assumed a character which leads him to desire council, and then, should any fatal result ensue from a continuance of such obstinacy, this course will free him from any subsequent imputations, of neglect, malpractice, etc.

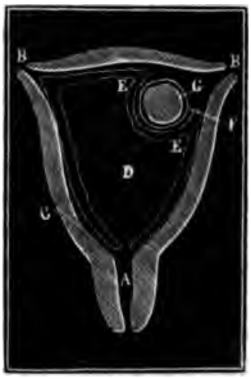
In a premature labor, the management will be the same as recommended for labor at full term; for as a general rule, during the last three months of pregnancy, the hand may be introduced within the uterus for the purpose of performing any manipulations which may be required. But I would make one observation, that if the hand of the practitioner be very large, and a manual operation is demanded during the seventh or eighth month, it will be safer for the patient, and very humane on the part of the medical attendant, to send for some medical friend, with a small hand. This is a point too little heeded, and which, of itself, is frequently a cause of grave results.

CHAPTER XX.

DEVELOPMENT OF THE HUMAN OVUM.

The changes undergone by the uterus, during pregnancy, have already been referred to; and it will now be proper to notice those changes which occur, during pregnancy, in the ovum, as it progresses in its development. Shortly after conception, a layer of coagulable lymph lines the whole internal surface of the uterus, which is at first of a soft, gelatinous nature, but which soon becomes imperfectly organized, vascular, and of a reddish color; it is called the *membrana caduca* (caducous membrane), or *membrana decidua* (deciduous membrane). Several other names have been applied to it, as *epichorion* by Chaussier, *epione* by Dutrochet, *perione* by Breschet, *anhistous membrane* by Velpeau, *adventitious lamina* by de Blainville, etc., etc. This membrane is about one line in thickness, and is in contact with the whole of the inner uterine surface; its inner, or fetal surface is smooth and polished, with striæ and depressions which lead into canals, bearing some resemblance to that of serous membranes, and its external or uterine surface is rough and unequal, and closely adheres to the internal surface of the uterus. It is not persistent in its character, as it is formed only during conception, and is expelled with the ovum and its membranes whenever this occurs. Within this membrane is a space or cavity called the *cavity of the decidua*, which is filled with a limpid, serous fluid, to which M. Breschet has given the name *hydroperion*. This fluid is present simultaneously with the caducous membrane, increases in quantity as the uterus enlarges, and continues to be secreted, according to Breschet, until the caduca vera and caduca reflexa come in contact with each other, or toward the fourth month; it is supposed that this liquid affords nourishment to the embryo during the early months, before a direct placental communication is established between it and its mother.

FIG. 28.



THE CADUCA, AFTER THE ARRIVAL OF THE OVUM INTO THE UTERUS.

A. The Cavity of the Uterine Neck.
B B. Uterine Orifices of the Fallopian Tubes.
C. External, or Uterine Caduca.
D. Cavity of the Decidua.
E E. Angles at which the Decidua vera is reflected by the advance of the Ovum.
F. Chorion.
G. Amnios.

The manner by which the ovum becomes enveloped in this membrane is supposed to be as follows; having passed through the Fallopian tube, until it arrives at its uterine orifice, it pushes before it a portion of the membrana caduca, until the whole ovum is surrounded and inclosed by this membrane (F, *Fig.* 28). The portion of membrane thus covering the ovum, is called the *decidua ovuli*, or *reflexa* (ovuline, or reflected decidua), while that in contact with the uterine walls, is termed the *decidua uteri*, or *vera* (uterine, or true decidua). As the ovum grows, the decidua reflexa approaches nearer and nearer to the decidua vera, the cavity of the decidua diminishes, until, finally, at the third month the cavity is obliterated, and the two decidua, coming in contact, become agglutinated into one membrane. The ovum, it will be seen, is not completely surrounded by the decidua reflexa, and at that part of the uterus from which this membrane was detached by the advancing ovum, the surface is lined by no membrane whatever. At this uncovered point a new structure is developed between it and the ovum, bearing some resemblance to the membrana decidua, and which is called *decidua serotina*, and here the subsequent formation of the placenta takes place. The uses of the membrana caduca, are, according to Moreau, "to prevent the ovum from floating loosely in the cavity of the uterus; to maintain it in contact with a fixed point of the parietes of this organ, until it has contracted sufficiently numerous and firm attachments to enable the embryo, after being developed during the first stages of pregnancy at the expense of the surrounding fluids, to extract from the blood of the mother, the materials suitable for its nutrition and subsequent growth; to determine the place of insertion, form, and extent of the placenta; to prevent superfetation; and, according to Lobstein, to transmit to the chorion and amnion the vessels which furnish these membranes with the elements of nutrition and exhalation."

The above is the description generally given by authors relative to the caducous membrane; still, it is not a settled question, and much diversity of opinion prevails in regard to it. Some consider it to be a secretion, or exhalation from the internal mucous coat of the uterus, effected by the peculiar excitement resulting from conception; while others view it as an exfoliation of this mucous coat, itself, which, from a similar cause, has undergone considerable changes in its consistence and vascularity. The former is the most commonly received opinion, and, probably, the most correct one; it maintains, that the excitement caused by a fruitful coition occasions the secretion of a plastic lymph, which coagulates and forms a kind of false membrane or caduca, analogous to those produced on inflamed surfaces by the exhalation and coagulation of an albuminous fluid, and which is entirely distinct from the mucous membrane, although it adheres, more or less firmly, to the latter by numerous vascular villi, or prolongations, which frequently extend into the canal of the cervix, or Fallopian tubes. When the adhesion of this false membrane is but slight, the ovum, upon entering the uterine cavity, instead of pushing forward a decidua reflexa at the orifice of the tube, may slip between the caduca and uterus, and form an attachment at some other point, thus giving rise to the various placental insertions which are met with in practice.

The opposite opinion maintains that the utricular glands of the uterus become elongated, augmented in size, and contorted, their secretion increases, the vessels of the mucous membrane become more fully developed in size and number, and a substance composed of nucleated cells fills up the interfollicular spaces in which the bloodvessels are contained. These changes produce a thickening and softening of the mucous membrane itself, with increased vascularity, thus forming the deciduous membrane. But, as Prof. Meigs observes, "I can not readily comprehend how, after all this structure is once thrown off as a decidua, it can ever be reproduced for the service of subsequent pregnancies." Dr. Carpenter inquires, if the views relative to the mucous membrane of the uterus being the decidua, are well-founded, how are we to explain the formation of the decidua continuously over the upper orifice of the cervix uteri, and over the orifices of the Fallopian tubes, as is frequently, though not always, the case?

Again, it has been asserted by Dr. Lee, that this membrane is not formed unless the ovum reaches the uterus, but in this he is evidently in error, as there are, at least to my mind, a sufficient number of facts recorded to prove its presence independent of the arrival of the ovum at the uterus. And, if I am not mistaken, Prof. Meigs, as well as other investigators, have observed the decidua in cases of extra-uterine pregnancy. Moreau states, that "it is even found in cases of tubular and ovarian pregnancy, provided the pregnancy be not too far advanced, and have not exceeded five or six months, for we are inclined to believe that it disappears at a later period." Velpeau denies that the membrane is organized, hence, he has called it *anhistous;* but there are sufficient proofs of its organization, as, for instance, its vascularity; it has also been injected by Ruysch, Burns, Lobstein, and others — beside, it is liable to disease, and toward the last becomes very thin, like serous or cellular tissue.

Hunter asserted that the deciduous membrane had three openings, one at the inner orifice of the cervix, and one at each orifice of the Fallopian tubes; were this the case, no decidua reflexa would be formed, but the ovum in entering the uterus, would at once pass through the opening into the cavity of the decidua, from whence it could escape out of the uterus through the opening at the inner orifice of the cervix, and no conception would result. Such openings in the membrane may occasionally be present, but according to the investigations of many excellent observers they do not occur as a general rule. It has also been denied that the decidua reflexa is a mere reflected portion of the decidua vera, as the texture of the two are said to be non-identical; and that the reflexa is probably formed by the agency of nucleated cells from the plastic materials thrown out from the decidua vera, in the same manner as the chorion is supposed to be formed in the Fallopian tube, from similar materials secreted from its lining membrane.

From this brief review of the subject, it will be seen that it is still involved in obscurity, and those who desire further information regarding it, are referred to the various essays by Hunter, Lee, Chaussier, Breschet, Velpeau, Carus, Granville, M. Coste, Weber, Sharpey, etc.

At the period of full development of the ovule, it escapes from the vesicle inclosing it, and passes into the Fallopian tube through the agency of the fimbriated extremity of this organ, gradually traversing its canal until it arrives at the uterine cavity. The modifications undergone by the human ovule in its passage through the Fallopian tube, are unknown, but are supposed to be similar to those which occur in the eggs of mammiferous animals, particularly those of the rabbit and dog. In these animals, the first change which has been observed in the ovule after its escape from the ovary, is the entire disappearance of both the germinal vesicle and germinal spot, while at the same time there will be found a collection of granules in the central portion of the ovum. During its travel through the first half of the oviduct, the vitelline membrane becomes somewhat thickened, while a layer of the granulations which formed the proligerous disk of the ovule previous to its departure from the ovary, surrounds the ovum, but which disappears as it traverses the second half of the oviduct, having a layer of a transparent, gelatinous substance to occupy its place around the vitelline membrane, and which albuminous layer, as well as the thickening of the vitelline membrane, continues to increase. While these changes are being effected, the yelk gradually increases in density, forming a compact, homogeneous mass — a transparent fluid occupying the space existing between it and the interior surface of the vitelline membrane; finally, the yelk separates into two regular spherical divisions; these again separate, forming four spheres, and this separation continues, until from the numerous small spherical divisions which are thereby formed, the yelk presents a mulberry or raspberry appearance. These spheres or granulations decompose as the ovum advances toward the cavity of the uterus, and finally disappear, being replaced by a clear and transparent fluid. They are supposed to condense on the inner wall of the vesicle, forming there a second vesicle which has been called the *blastodermic vesicle* or *membrane*, or *germinal membrane* or *area*. As this blastoderm becomes developed after the arrival of the ovum in the uterus, the albuminous layer surrounding the vitelline membrane disappears, while this membrane diminishes in thickness.

About the sixteenth or seventeenth day will be observed a rounded, whitish spot, at some point of the blastodermic vesicle, standing out apparently detached, and which is named the *embryonic spot*, or *tache embryonnaire;* it is composed, the same as the blastoderm, of cellular granulations, and from it commences the gradual development of the embryo. The blastoderm is composed of two laminæ, the *external* or *serous layer*, and the *internal, mucous*, or *vegetative layer*, the former of which is supposed to give origin to the brain and spinal cord, organs of sense, cartilage, bones, skin and muscles, and the latter to the lungs, liver, spleen, and digestive tube. A third layer has also been recognized by some investigators, which is situated between the two just named; it is called the *middle* or *vascular layer*, and is supposed to assist in the development of the heart, circulatory apparatus, etc. The time required for the passage of the human ovum from the ovary to the uterus is supposed to be from eight to ten or twelve days, and it is about this latter period, the twelfth day of pregnancy, that we can distinctly observe the embryo, which then appears to be a mere amorphous vesicle, measuring about three lines, while the entire ovum measures six or seven lines. The envelopes of the ovum are three, the CHORION, TUNICA MEDIA, or MIDDLE MEMBRANE, and the AMNION; and its accessories are four, the UMBILICAL VESICLE, the ALLANTOIS, the PLACENTA, and the UMBILICAL CORD.

The CHORION is a thin, glistening, transparent membrane, very analogous to serous tissues, quite resisting for its tenuity, and forms the external covering of the ovum, passing also over the fetal surface of the placenta and the external face of the umbilical cord, and may be considered as corresponding to the internal lining membrane of an egg-shell. It is formed by the union of the vitelline membrane with the albuminous envelope which this acquires while in the oviduct; however, this is still a question among physiologists, some of whom suppose it to be formed by the external layer of the blastodermic vesicle and the allantois. It has two surfaces, an inner or fetal surface, and an external or uterine surface. Both of these surfaces are smooth at first, but at an early period, about the second week of pregnancy, the external surface presents minute granulations, which rapidly augment in length, forming numerous villi or velvety prolongations with which the chorion soon becomes covered. These spongy, cylindrical villi disappear from the general surface about the second month, but at the spot where the chorion comes in contact with the uterus, and where the secondary caduca or *decidua serotina* is formed, they enlarge and become vascular, giving origin to the placenta. The vascularity of the chorion does not manifest itself until after the development of the allantois, when it consists of two layers or laminæ, the *external* or primitive one of which is non-vascular, and is called the *exochorion;* while the other, the *internal* or allantoid layer, is highly vascular, and is named *endochorion.* In the early period of pregnancy the chorion is separated from the amnion by an albuminous layer, which condenses into a thin web-like membrane termed *tunica media;* and this albuminous fluid is more abundant in the first weeks of gestation. In the midst of this fluid is situated the umbilical vesicle. As the ovum matures, the external face of the chorion unites with the decidua reflexa, while its inner face comes in contact with the amnion after the second month; there have been instances, however, where at full term, a considerable quantity of fluid existed between the amnion and chorion, termed *false waters;* its escape has given rise to the belief that the liquor amnii had passed off. When this fluid is discharged several times during one pregnancy, it constitutes *hydrorrhea* (*see page* 164). The chorion serves to envelope and protect the ovum during its passage from the oviduct to the uterus, furnishes a sheath for the umbilical cord, assists in the production of the placenta, and, probably through the attachment of its villi to the decidua, nourishment is absorbed from the maternal blood by which the vitality of the embryo is sustained; at the parturient period it assists, in connection with the amnion, to form a bag containing the amniotic liquor, which materially promotes the softening and dilation of the os uteri.

The AMNION is the most internal covering of the ovum, around which it forms a sac; it is very thin, smooth, and transparent, and is more dense and resisting than the chorion, which it very much resembles in structure and appearance. It is supposed to be formed by the internal lamina of the fold of the external serous layer of the blastoderm around the embryo (which forms the cephalic and caudal hoods), and is continuous with the margins of the ventral opening of the embryo; however, there are several other views concerning its origin. Its internal surface exhales a liquid in which the embryo floats freely; its external surface is more or less separated from the chorion, the space between them being filled with an albuminous liquid. It apparently consists of condensed cellular tissue, in which neither bloodvessels nor nerves have yet been recognized. As the development of the ovum progresses, the space between the amnion and chorion diminishes, the albuminous fluid found between them gradually disappears, until finally the two envelopes come in contact and adhere to each other. The amnion forms the outer coat of the fetal face of the placenta, and of the cor sion of the cord shows us the chorion placed between th and the amnion. Its uses are to furnish the liquor a forming the membranes, and bag of waters, and to serve to the umbilical cord, the liquor amnii, and the fetus.

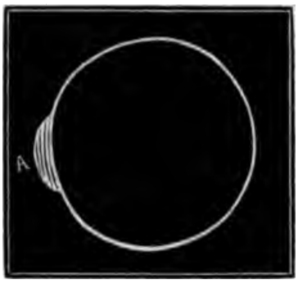
The LIQUOR AMNII, also known as the *amniotic flu amnios*, etc., is a fluid contained within the amnion, an embryo floats; by some it is supposed to be an exhalati from the amnion, by others to be a product of the fetus again to be a secretion from both the fetus and its paren bility is, that the liquor amnii proper is exhaled by th face of the membranes of the ovum, the elements of whic by the uterine vessels, and that it may be mixed or a the fetal excretions, especially at an advanced period This fluid varies in quantity as well as in its propert early stage of gestation, when compared with the fetus, ally greater, there being from half a fluidrachm to a flu when the embryo can hardly be seen by the naked ey it continues to increase until full term, yet its relativ the size of the fetus, gradually diminishes, so that at p the fetus may weigh from six to eight pounds, the quan seldom be found to exceed a pint. In some few cases it quarts. Its appearance varies from that of a transpar fluid, more commonly observed in the early period of pr of a thick, slightly yellow, green, or brown color, and usual to the advanced stage. It is soft and viscous to t specific gravity of 1.004, and emits an odor somewhat r of semen, though occasionally, especially when the fetu odor is putrid and very offensive; its taste is saltish. becomes milky, or clouded, and frequently contains whi are detached pieces of the fetal sebaceous covering; gre colored flakes, being portions of undiluted meconium, are observed in it. Its most common appearance at parturitic dingy liquid, having a tinge of yellow or green. Hea cloudy; alcohol or caustic Potassa causes a fleecy precipitat nutgalls form a brownish deposit, similar to a dilute solutio Nitrate of Silver occasions an abundant white precipitate, w uble in Nitric Acid; and the tincture of Violets becomes green by it. Analysis has found in it a large proportion of albumen, albuminate of soda, chloride of sodium, carbona phosphate and carbonate of lime, urea, and, probably, a peculiar free acid, called *amnic* or *amniotic acid*. Its use appears to be to protect the embryo from any severe compression of the uterine walls; to protect it from the effects of falls or blows; to prevent any adhesion of the fetus while in utero, and allow it free motion; to protect the fetus, during parturition, from the injurious effects of uterine contraction upon its body, until all the parts are in a suitable condition to permit its expulsion, to aid in the dilation of the os uteri, at term, by means of the bag of waters, as well as to lubricate the parts through which the fetus has to pass, thereby facilitating its delivery. Some physiologists believe that it likewise aids in nourishing the fetus, previous to the formation of the placenta and establishment of the fetal circulation.

The UMBILICAL VESICLE, *vesicula umbilicus*, or *vesicula alba*, is formed by the internal, or mucous layer of the blastoderm; it is of a rounded, or pyriform shape, is situated in the space between the amnion and chorion, and communicates by a long pedicle, or duct, with the intestinal tube, upon which it lies. It forms a sac, seldom larger than a small pea, and contains a viscid, transparent, yellowish-white fluid, in which may be seen a few globules, and numerous granules. It appears to be composed of an external or vascular layer, and an internal or mucous layer. The following account of its formation, is given by Prof. Meigs: "When the blastoderm has partly undergone the morphological changes that convert it into the earliest rudimental embryon, part of the yelk corpuscles still remain unappropriated; and as they are still contained in their original vitelline membrane, they constitute a small, but visible ball, called the umbilical vesicle. Originally, the vitellus was a sphere, of which *Fig.* 29 represents a segment. The blastoderm is developed upon a segment of this sphere as at A, in *Fig.* 30. When the blastoderm doubles or folds its edges inward, it pinches (or contracts), a portion of the vitellary ball, as in *Fig.* 31. In a still further progress, as shown by *Fig.* 32, the portion of the vitellary ball that remains outside of the embryon is connected to the embryo by a delicate tube, or vitellary duct." Velpeau states, that this duct opens into the fetal ilium; Rigby, Ludlow, and Oker, consider the appendicula vermiformis as the remains of it. As pregnancy advances, the umbilical vesicle becomes atrophied, and the development of the amnion removes it further and further from

FIG. 29.

SEGMENT OF THE SPHERE OF THE VITELLUS.

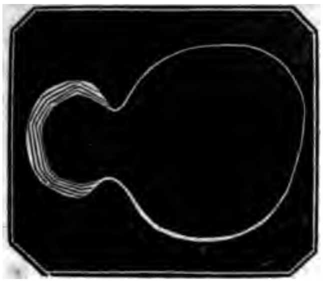
FIG. 30.



BLASTODERM DEVELOPED UPON THE SEGMENT OF THE SPHERE OF THE VITELLUS.

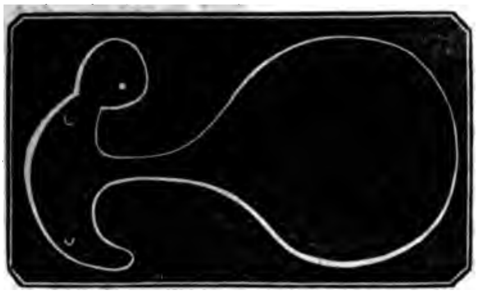
the embryo, at the same time elongating its duct or pedicle, the canal of which remains open till the sixth, or eighth week of gestation, after which it is obliterated, and the umbilical vesicle becomes flattened, diminished, of a lenticular shape, and gradually fused into the cord, and entirely disappears after the third or fourth month; in a few rare cases, it has been found at full term. Its use is supposed to be to afford nourishment to the embryo, until its placental connection with the mother is established.

FIG. 31.



INWARD FOLDING OF THE EDGES OF THE BLASTODERM.

FIG. 32.



FURTHER PROGRESS OF THE BLASTODERM.

The external or vascular layer of the umbilical vesicle has ramifying over its parietes two bloodvessels, an artery and a vein, which are called the *omphalo-mesenteric*, or *vitello-mesenteric vessels*, and which accompany the pedicle, forming a part of it. The *omphalo-mesenteric artery* arises from the aorta, and as it reaches the summit of the intestinal convolutions, it gives off branches to the mesentery and to the intestine; then it extends to the pedicle, through which it passes until it reaches the umbilical vesicle, upon which it is distributed. In the adult, that part which supplies the mesentery is converted into a mesenteric artery, all the rest being obliterated, as the umbilical vesicle disappears. The *omphalo-mesenteric vein*, enters the abdomen, passes around the duodenum, and opens into the umbilical vein just as this is emerging from the liver. In its passage around the duodenum it gives off branches to the stomach and intestines, and when it empties into the umbilical vein, it sends a large trunk to the liver; the whole disappears with the vesicle and its pedicle, except that portion which furnishes the above branches, which remains in the adult as the *ventral*, or *hepatic-portal vein*. Prof. Meigs admirably illustrates the arrangement of the omphalo-mesenteric vessels and cord, by the following diagram, *Fig.* 33: "Let A A, be a portion of the abdomen of the embryo, and C C, the navel, or umbilical ring; B B, the navel string, or cord, laid open; D, the umbilical vein, bringing back the blood from the placenta, and passing into the belly at the ring, to go to the liver; E, F, the two umbilical arteries of the fetus; H, the umbilical vesicle, or vitelline sac, whose pipe, conduit, or efferent-duct runs along the umbilical cord to the navel, and passing into the belly empties itself into the ilium, G G, which bends up to receive the discharge; K, L, represents the omphalo-mesenteric vessels."

FIG. 33.

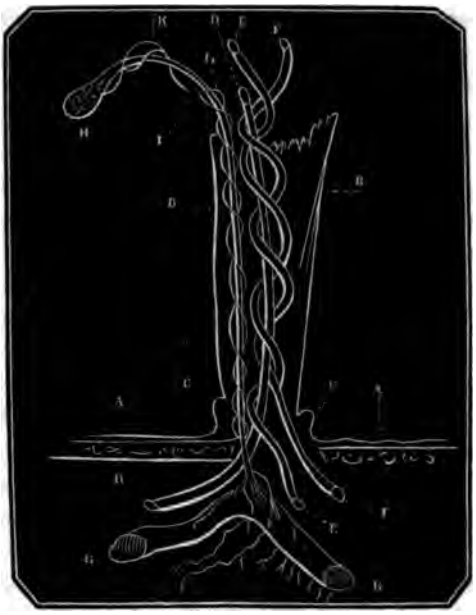


DIAGRAM OF THE OMPHALO-MESENTERIC VESSELS.

The ALLANTOIS, or *allantoid vesicle*, is a small sac, or bladder, which may be observed about the tenth day, and which arises from the inferior part of the intestinal canal, or caudal extremity of the embryo; it is found near the umbilical vesicle, between the chorion and amnion; its growth is rapid, and it soon becomes attached, by its base, to the inner surface of the chorion. On the parietes of the allantois are distributed the terminal branches of the two umbilical arteries and vein. The *urachus*, or *pedicle of the allantois*, is a cord, which is pervious in early embryonic life, and which passes out of the fetal body at the navel, being accompanied by the umbilical bloodvessels to the chorion, which they pierce, sending branches into its villi, which increase in size as these villi form the placental connection with the uterus.

The allantois rapidly disappears, so that in a few days after its appearance there can be observed only a cord of greater or less length, passing from the embryo to the chorion, and containing the umbilical vessels within it; this cord, likewise, gradually becomes lost in the substance of the umbilical cord, only a portion of it remaining within the abdomen of the embryo, to form the urachus, at the rectal termination of which is subsequently formed the urinary bladder. In consequence of this early disappearance of the allantois, many physiologists have denied its existence. The use of this vesicle, or membrane, is to conduct blood from the embryo to the chorion, or, as remarked by Prof. Meigs, "the allantois may be said to be a bladder, or vesicle, upon which the umbilical arteries climb toward the wall of the womb, to attach themselves there." It is, likewise, stated to receive the urine of the fetus, secreted in early uterine life. Dr. Carpenter makes the following remarks in relation to this vesicle:

"With the evolution of a circulatory apparatus, adapted to absorb nourishment from the store prepared for the use of the embryo, and to convey it to its different tissues, it becomes necessary that a respiratory apparatus should also be provided, for unloading the blood of the carbonic acid, with which it becomes charged during the course of its circulation. The temporary respiratory apparatus, now to be described, bears a strong resemblance in its own character, and especially in its vascular connections, with the gills of the mollusca; which are prolongations of the external surface (usually near the termination of the intestinal canal), and which almost invariably receive their vessels from that part of the system. This apparatus is termed the allantois. It consists at first of a kind of diverticulum, or prolongation, of the lower part of the digestive cavity, the formation of which has been already described. This is at first seen as a single vesicle, of no great size; and in the fetus of mammalia, which is soon provided with other means of ærating its blood, it seldom attains any considerable dimensions. In birds, however, it becomes so large as to extend itself around the whole yelk-sac, intervening between it and the membrane of the shell; and through the latter it comes into relation with the external air. The diagram (*Fig.* 34), will serve to explain its origin and position in the human ovum. The chief office of the allantois, in mammalia, is to convey the vessels of the embryo to the chorion; and its extent bears a pretty close correspondence with the extent of surface, through which the chorion comes into vascular connection with the decidua. Thus, in the carnivora, whose placenta extends like a band around the whole ovum, the allantois also lines the whole inner surface of the chorion, except where the umbilical vesicle comes in contact with it. On the other hand, in man and the quadrumana, whose placenta is restricted to one spot, the allantois is small, and conveys the fetal vessels to one portion only of the chorion. When these vessels have reached the chorion, they ramify in its substance, and send filaments into its villi; and

Fig. 64.

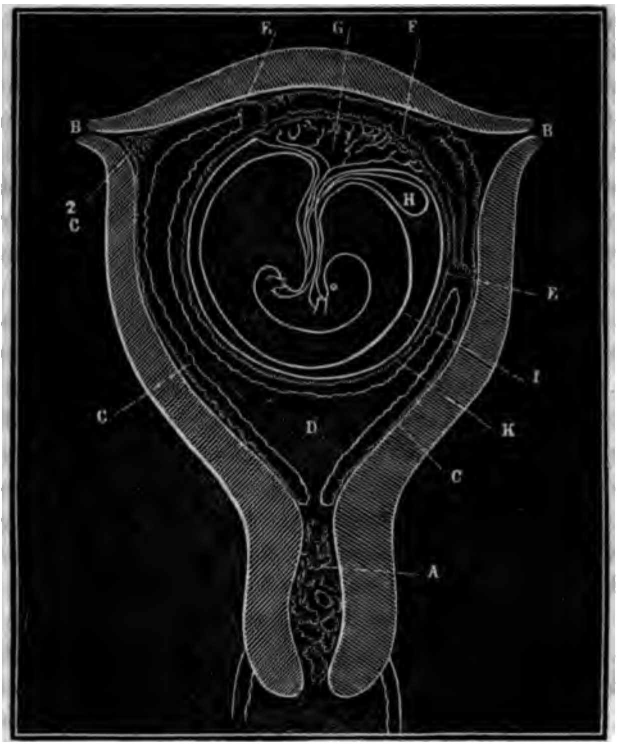


Diagram of the Human Ovum at the time of the formation of the Placenta.

A.	Muco-gelatinous substance blocking up the Os Uteri.
B B.	Fallopian Tubes.
C C.	Decidua Vera, at 2 C, prolonged into the Fallopian Tube.
D.	Cavity of the Uterus, almost completely occupied by the Ovum.
E E.	Angles at which the Decidua Vera is reflected.
F.	Decidua Serotina.
G.	Allantois.
H.	Umbilical Vesicle.
I.	Amnios.
K.	Chorion, with the outer fold of Serous Tunic.

in proportion as these villi form that connection with the uterine structure, which has been already described, do the vessels increase in size. They then pass directly from the fetus to the chorion, and the allantois being no longer of any use, shrivels up, and remains as a minute vesicle, only to be detected by careful examination. The same thing happens in regard to the umbilical vesicle, from which the entire contents have been by this time exhausted; and from henceforth the fetus is entirely dependent for the materials of its growth, upon the supply it receives through the placenta, which is conducted to it by the vessels of the umbilical cord. This state of things is represented in the diagram (*Fig.* 34). The allantois has a correspondence in situation with the urinary bladder; but it is only the lower part of it, pinched off, as it were, from the rest, that remains as such. The duct by which it is connected with the abdomen gradually shrivels; and a vestige of this is permanent, forming the *urachus*, or suspensory ligament of the bladder, by which it is connected with the umbilicus. Before this takes place, however, the allantois is the receptacle for the secretion of the *corpora wolffiana*, and of the true kidneys, when they are formed."

The PLACENTA or *afterbirth* is a soft, spongy, vascular mass, occupying about one-third of the external covering of the ovum, and forming the principal connection between the embryo and the uterus. It is a flattened, irregularly circular body, of a more or less intense reddish-gray color, varying in diameter from six to nine inches, sometimes having one diameter longer than the others, about an inch in thickness at its point of junction with the umbilical cord, from which it gradually tapers off toward the circumference, which seldom exceeds two or three lines, and weighing one or two pounds, depending, however, upon its size and the amount of blood it contains. It most usually has the umbilical cord inserted at its center; occasionally this passes into it, at or near the circumference, and with this disposition the vessels of the cord will frequently be found to separate into numerous branches before they reach the substance of the placenta; this is termed the *battledore placenta*. The placenta, umbilical cord, and membranes, are collectively called the *secundines*.

The placenta presents two surfaces, an *external* or *uterine*, and an *internal* or *fetal*. The *fetal surface* has a smooth, polished appearance, and is marked by the numerous radiations of the vessels of the umbilical cord, forming a kind of network, which may enable us to distinguish the placenta in artificial deliveries; this surface is covered by the chorion and amnion, the former of which intimately adheres to it, and sends processes between the lobules, while the latter is loose and nearest the fetus. The *uterine surface*, when removed from the uterine wall, presents a uniform, but not smooth appearance, and is slightly convex; it has a fleshy resemblance, and is divided by deep sulci or furrows into numerous irregularly shaped lobes, which are connected with each other, at the bottom of these sulci, by a loose cellular, or, according to Velpeau, lamellated, albuminous tissue, which is easily lacerated. Upon an investigation, it will be found that each of these lobes or cotyledons, is formed by the ramifications of one branch of the umbilical arteries and veins, on their first separation, and that the vessels of one lobe do not anastomose with those of another, and but slightly with each other. This surface is not in direct contact with the uterine wall, but is separated from it by the interposition of the *decidua serotina*, an albuminous layer analogous in appearance to the true caducous membrane, which is more firmly attached to the placenta than to the uterus, and which enters into the fissures separating the lobes, when not too deep, in which latter case it passes from one lobe to another, forming a kind of membranous bridge, while a thick partition of cellulo-mucous substance penetrates deeply between the lobes. The *circumference* of the placenta is thin and irregular, and measures from twenty-one to twenty-seven inches; its margin is continuous with the chorion, and is contiguous to the fold formed by the caduca when passing over the ovum to constitute the decidua reflexa; between this fold and the placental circumference, is a thickening or density of substance, so disposed for the reception of the placental border as to form a triangular sinus.

The earliest rudiments of the placenta are observed toward the termination of the first month of pregnancy, which become gradually developed until the third month, when the organ acquires its proper character, and continues to increase in size with the growth of the fetus. As soon as the ovule has reached the uterus, the chorion is observed to be covered with numerous villi which give to it a downy appearance, but those villi in contact with the decidua reflexa, probably from an absence of proper material for their development, become atrophied and filamentous, serving merely as points of union between the chorion and decidua; while those which are exposed to the uterine wall, receiving nourishment from the exudation of lymph which takes place on the surfaces of both the uterus and ovum, continue to develop themselves, elongate, become converted into vessels, and ultimately form the placental part of the placenta. (*Fig.* 34.) The uterine portion of the placenta is the lymph above referred to, which forms a thin, delicate tissue known as the decidua serotina, and which is furnished more copiously by the uterus, on account of the superior size and vitality of this organ compared with those of the ovum. At that portion of the uterus where the placenta is situated, will be found large cells or sinuses which communicate freely with each other, but which do not extend beyond the decidua serotina, this membrane answering the purpose of a valve to prevent the blood in them from passing into the cavity of the gravid uterus; these cells are the uterine sinuses, and into them the blood is poured by the curling uterine arteries terminating in a capillary extremity. The capillary vessels of the fetus, covered by the thin decidua, insinuate themselves into these sinuses, and, without any interference of the circulation of either the fetal or maternal fluid, the change is here effected which probably removes the effete matter of the fetal blood, while at the same time this fluid absorbs oxygen from the maternal blood; and these changes are brought about without the existence of any vascular intercommunication between the mother and fetus, the action somewhat resembling that which takes place in the lungs of an adult, between the venous blood and the atmospheric air. The placenta may attach itself to any part of the internal surface of the uterus, more commonly at or near the orifice of one of the tubes, occasionally in the vicinity toward the fundus, rarely toward the neck, and still more seldom over the inner os uteri; this latter position is termed *placenta prævia*, and is dangerous to both mother and child on account of the hemorrhage which is apt to ensue as it becomes detached from the uterine wall, during labor, by the dilatation of the os uteri. These placental situations are supposed to be determined by the character of the adhesion existing between the caduca and uterine wall, as to firmness as well as to the degree of resistance afforded by the caduca to the advancing ovule; thus, if the adhesion be weak between the decidua and uterine wall at the utero-tubal orifice, the ovule may slip or pass down between them until it meets with sufficient resistance to impede its further progress, and at this point, where it is stayed, commences the formation of the decidua reflexa, as well as of the placenta. And if the attachment be so slight as to permit the fecundated ovule to pass out of the uterus and through the canal of the cervix, conception does not take place. It must be borne in mind, that the attachment of the placenta is by apposition only, the decidua serotina being interposed between it and the uterine wall; and when actual adhesion occurs, it is invariably the result of disease.

In cases where more than one fetus is present, we generally find a separate cord, placenta, and set of membranes for each one, and though the placentæ may be joined together, forming apparently a single organ, yet there will be no anastomosing of the bloodvessels, the circulation of each child being perfectly independent, so that should one die or become diseased in utero, the other may continue to live or be healthy. In some few instances, there have been found exceptions to this — two children have been inclosed in one bag of membranes, or when in separate ones, there has been a communication of their vascular systems. The use of the placenta is to form the principal connection between the embryo and the uterus in order to contribute to the nourishment of the former. (*Fig.* 34.)

The UMBILICAL CORD, *funis umbilicalis*, or *navel string*, is a long, flexible and vascular cord which serves as a connecting medium between the fetus and placenta. It has two insertions, a placental and a fetal. The placental insertion is usually in the center of the placenta, though it may occur at any point between the center and circumference of this organ; the fetal insertion is at the umbilicus. At birth, its average length is from sixteen to twenty-four inches, though it frequently varies from this measurement, having been found several feet long, and again only six or seven inches. Its thickness is likewise variable; ordinarily it is about equal to that of the little finger; when it exceeds this it is termed a *fat cord*, and when it is smaller it is called a *lean cord*. This variation in its thickness depends upon the larger or smaller amount of a viscid, semitransparent fluid which is infiltrated in the cellular tissue of the cord, and which is named the *gelatine of Wharton;* this fluid is coagulable by heat and acids, and when unequally distributed occasions swellings or nodes on the cord.

During the early weeks of pregnancy the umbilical cord does not exist; its first appearance is about the end of the first month, when the embryo is fully separated from the blastodermic vesicle, at which period it is composed of the duct of the umbilical vesicle, urachus, the omphalo-mesenteric vessels, and a covering of amnion and chorion. It is now cylindrical, thick and short, but elongates in proportion as the umbilical vesicle removes and disappears. At about the commencement of the third month, the umbilical vesicle, urachus, and omphalo-mesenteric vessels being obliterated and amalgamated with the cord; this now consists of two arteries, one vein, fine areolar tissue, gelatine of Wharton, and an external covering of amnion and chorion, which elements remain until the termination of pregnancy. At first the cord is straight, but after the second month, a torsion of the vessels commences, the two arteries run uniformly and spirally around the vein, usually in a direction from left to right; the vein thus occupying the axis of the cord.

The vein of the umbilical cord is of a thickness nearly, if not quite equal, to that of the two arteries combined; it has no valves, its walls are thin but firm, and it performs the functions of an artery, carrying the pure and vitalized blood from the placenta to the fetus. It arises from the placenta; the venous ramifications of each placental lobe uniting on the surface of the placenta to form the cord, which passes onward into the umbilical ring of the fetus, where it separates from the two arteries and proceeds toward the liver.

The two arteries of the umbilical cord arise from the fetal internal iliacs, of which they are branches, and proceed toward the umbilicus, where they separate and traverse the vein in a tortuous manner until they reach the placenta, into which they give off numerous ramifications. The walls of the arteries are thick, resisting, and contractile, and they pulsate strongly. The arteries perform the office of veins, as they convey the adulterated blood from the fetus to the placenta. It is very rarely that any different arrangement of the cord from the above, has been observed; a few instances have been related where but one artery was present, and Velpeau has stated that two veins have been met with. The colors of the blood in the vein and arteries resemble each other so nearly as to be scarcely distinguishable.

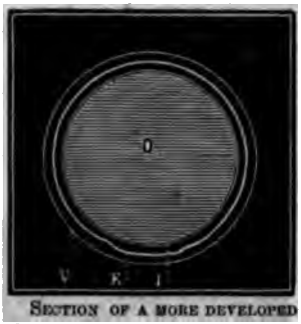
The cord is subject to abnormities and accidents, as, a division of the vessels before having reached the placenta, a varicose or hydatidic condition, a rupture of the coats, a closure of the vessels, an insertion into some other part of the fetus than the umbilicus, or into a wrong part of the decidua, and twists or knots, especially when the cord is very long, which interfere more or less with the circulation and consequent nutrition of the fetus. Any of these conditions may occasion the death of the fetus, and abortion, though, some of them, when slight, exert no important influence. The cord is most commonly above the head of the child, yet there are often exceptions; it has been found coiled once or twice around the child's neck, or body, or a limb, in some instances causing death by strangulation, or the loss of a limb; occasionally, it is found presenting before the fetal head. In cases of twins, each fetus has its own cord, though instances have been met with where there existed a communication between the cords of the several fetuses.

CHAPTER XXI.

OF THE FETUS AND ITS DEVELOPMENT.

The *ovule* or *ovum* is the human egg previous to its impregnation, though these terms are frequently applied to the embryo and the fetus; as long as this is amorphous or of an undetermined form, it has received the name of *germ;* from the period when a definite form can be observed until the third month, it is called the *embryo,* from which time until its expulsion from the uterus, the term *fetus* is applied to it. After birth it becomes the *child* or *infant,* though either of these latter terms are often used synonymously with *fetus.*

Fig. 35.



Section of a more developed Ovum, in which the two portions—the embryonic and umbilical vesicle—begin to appear.
O. Umbilical Vesicle.
I. Internal layer of the Blastoderma.
E. External layer.
V. Vitelline Membrane.

The study and investigation of the development of the human embryo (*Fig.* 35), is one which the student finds attended with considerable difficulty; for, notwithstanding the many discoveries of physiologists on this point, there still remain much obscurity and uncertainty attached to it, as is evident from the various views which have from time to time been presented to the profession. Dr. Rigby, in his work on Midwifery, has probably, given the clearest, and at the same time the most concise illustration of the researches and conclusions of those who have investigated the subject, as will be found in the following quotation, which will, I trust, prove acceptable to all who are interested:

"*Embryo.*—There is, perhaps no department of physiology which has been so remarkably enriched by recent discoveries, as that which relates to the primitive development of the ovum and its embryo. The researches of Baër, Rathke, Purkinje, Valentin, etc., in Germany; of Dutrochet, Prevost, Dumas, and Coste, etc., in France; and of Owen, Sharpey, Allen, Thompson, Jones, and Martin Barry, in England, but more especially those of the celebrated Baër have greatly advanced our knowledge of these subjects, and led us deeply into those mysterious processes of nature which relate to our first origin and formation.

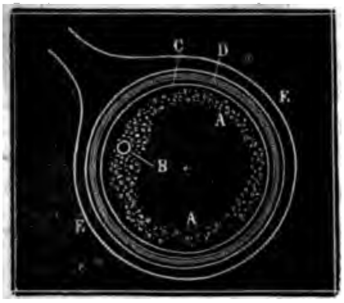
"These researches have all tended to establish one great law, connected with the early development of the human embryo, and that of other mammiferous animals, viz: that it at first possesses a structure and arrangement analogous to that of animals in a much lower scale of formation; this observation also applies, of course, to the ovum itself, since a variety of changes take place in it after impregnation, before a trace of the embryo can be detected.

"At the earliest periods, the human ovum bears a perfect analogy to the eggs of fishes, amphibia, and birds: and it is only by carefully examining the changes produced by impregnation in the ova of these lower classes of animals, that we have been enabled to discover them in the mammalia and human subject.

"As the bird's egg, from its size, best affords us the means of investigating these changes, and as in all essential respects they are the same in the human ovum, it will be necessary for us to lay before our readers a short account of its structure and contents, and also of the changes which they undergo, after impregnation. In doing this, we shall merely confine ourselves to the description of what is applicable to the human ovum.

"The egg is known to consist of two distinct parts, the vitellus or yelk surrounded by its albumen or white; to the former of these we now more particularly refer. The yelk is a granular albuminous fluid, contained in a granular membranous sac (the *blastodermic membrane*), which is covered by an investing membrane called the *vitelline membrane* or *yelk-bag*. The impregnated vitellus is retained in its capsule in the ovary, precisely as the ovum of the mammifera is in the Graafian vesicle. The whole ovary in this case has a clustered appearance, like a bunch of grapes, each capsule being suspended by a short pedicle of indusium.

FIG. 36.



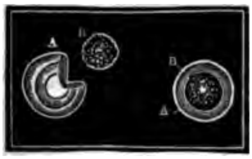
SECTION OF A HEN'S EGG WITHIN THE OVARY.

A. The Granulary Membrane forming the Periphery of the Yolk.
B. Vesicle of Purkinje, imbedded in the Cumulus.
C. Vitellary Membrane.
D. Inner and Outer Layers of the Capsule of the Ovum.
E. Indusium of the Ovary.

"In those ova which are considerably developed before impregnation, the granular blastodermic membrane is observed to be thicker, and the granules more aggregated at that part which corresponds to the pedicle, forming a slight elevation with a depression in its center, like the cumulus in the proligerous disk of a Graafian vesicle. This little disk is the blastoderma, germinal membrane, or cicatricula; in the central depression just mentioned is an exceedingly minute vesicle, first noticed by Professor Purkinje, of Breslau, and named after him: in more correct language, it is the *germinal vesicle*.

"According to Wagner, the germinal vesicle is not surrounded by a disk before impregnation; and it is only after this process that the above mentioned disk of granules is formed. By the time the ovum is about to quit the ovary, the vesicle itself has disappeared, so that an ovum has never been found in the oviduct containing a germinal vesicle, nothing remaining of it beyond the little depression in the cumulus of the cicatricula.

FIG. 37.



A. Vitelline Membrane.
B. Blastoderma.
From T. W. Jones.

"The rupture of the Purkinjean or germinal vesicle has been supposed by Mr. T. W. Jones to take place before impregnation; but the observations of Professor Valentin seem to lead to the inference that it is a result of that process, and must be therefore looked upon as one of the earliest changes which take place in the ovum or yelk-bag upon quitting the ovary.[*]

"During its passage through the oviduct (what in mammalia is called the Fallopian tube), the ovum receives a thick covering of albumen, and as it descends still farther along the canal the membrane of the shell is formed.

"On examining the appearance of the ovum, in mammiferous animals, and especially the human ovum, it will be found that it presents a form and structure very analogous to the ova just described, more especially those of birds. It is a minute spherical sac, filled with an albuminous fluid, lined with blastodermic or germinal membrane, in which is seated the germinal vesicle or vesicle of Purkinje. When the ovum has quitted the ovary the germinal vesicle disappears, and on entering the Fallopian tube it becomes covered with a gelatinous, or rather albuminous covering. This was inferred by Valentin, who considered that 'the enormous swelling of the ova, and their passage through the Fallopian tubes,' tended to prove the circumstance. (*Edin. Med. and Surg. Journ.*, April 1836.) It has since been demonstrated by Mr. T. W. Jones, in a rabbit seven days after impregnation. The vitellary membrane seems, at this time, to give way, leaving the vitellus of the ovum merely covered by its spherical blastoderma, and incased by the layer of albuminous matter which surrounds it.

"From what we have now stated, a close analogy will appear between the ova of the mammalia and those of the lower classes, more especially birds, which from their size afford us the best opportunities of investigating this difficult subject.

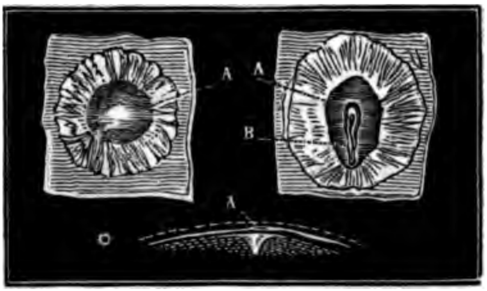
"In birds, the covering of the vitellus is called *yelk-bag;* whereas, in mammalia and man it receives the name of *vesicula umbilicalis.* Its albuminous covering, which corresponds to the white and membrane of the shell in birds, is called *chorion:* by the time that the ovum has reached the uterus, this outer membrane has undergone a considerable change; it becomes covered with a complete down of little absorbing fibrillæ, which rapidly increase in size as development advances, until it presents that tufted, vascular appearance, which we have already mentioned when describing this membrane.

---

[*] We said, "*one* of the earliest changes." Mr. Jones considers that "the breaking up of the surface of the yelk into crystalline forms," is the first change which he has observed.

"The first or primitive trace of the embryo is in the cicatricula or germinal membrane, which contained the germinal vesicle before its disappearance. In the center of this, upon its upper surface, may be discovered a small dark line:[*] 'this line or primitive trace is swollen at one extremity, and is placed in the direction of the transverse axis of the egg.'

FIG. 38.



A. Transparent Area. B. Primitive Trace.

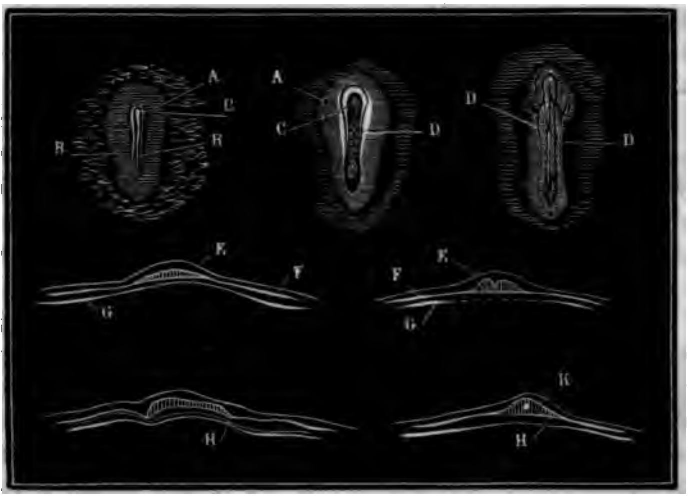
"As development advances, the cicatricula expands. 'We are indebted to Pander,'[†] says Dr. Allen Thompson, in his admirable essay above quoted, 'for the important discovery, that toward the twelfth or fourteenth hour, in the hen's egg the germinal membrane becomes divided into two layers of granules, the serous and mucous layers of the cicatricula; and that the rudimentary trace of the embryo, which has at this time become evident, is placed in the substance of the uppermost or serous layer.' 'According to this observer, and according to Baër, the part of this layer which surrounds the primitive trace soon becomes thicker; and on examining this part with care, toward the eighteenth hour, we observe that a furrow has been formed in it, in the bottom of which the primitive trace is situated; about the twentieth hour this furrow is converted into a canal open at both ends, by the junction of its margins (the *plicæ primitivæ* of Pander, the *laminæ dorsales* of Baër): the canal soon becomes closed at the cephalic or swollen extremity of the primitive trace, at which part it is of a pyriform shape, being wider here than at any other part. According to Baër and Serres, some time after the canal begins to close, a semi-fluid matter is deposited in it, which on its acquiring greater consistence, becomes the rudiment of the spinal cord; the pyriform extremity or head is soon after this seen to be partially subdivided into three vesicles, which being also filled with a semi-fluid matter, gives rise to the rudimentary state of the encephalon.' 'As the formation of the spinal canal proceeds, the parts of the serous layer which surround it, especially toward the head, become thicker and more solid, and before the twenty-fourth hour we observe on each side of this canal four or five round opaque bodies; these bodies indicate the first formation of the dorsal vertebræ.

---

[*] Allen Thompson on the Development of the Vascular System in the Fetus of Vertebrated Animals. (*Edin. New Philosoph. Journ.*, Oct. 1830.)

[†] Pander, Beiträge zur Entwickelungs-geschichte des Hünchens im Eie. Würzburg. 1817.

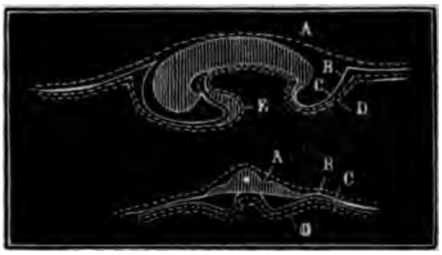
Fig. 39.



A. Transparent Area.
B. Laminæ Dorsales.
C. Cephalic End.
D. Rudiments of Dorsal Vertebræ.
E. Serous Layer.
F. Lateral Portion of the Primitive Trace.
G. Mucous Layer.
H. Vascular Layer.
K. Laminæ Dorsales united to form the Spinal Canal.

"'About the same time, or from the twentieth to the twenty-fourth hour, the inner layer of the germinal membrane undergoes a farther division, and by a peculiar change is converted into the vascular mucous layers.' (A. Thompson, *op. cit.*) It will thus be seen, that the germinal membrane is that part of the ovum in which the first changes produced by impregnation are observed. The rudiments of the osseous and nervous systems are formed by the outer or serous layers; the outer covering of the fetus or integuments, including the amnios, are also furnished by it. 'The layer next in order, has been called *vascular*, because in it the development of the principal parts of the vascular system appears to take place. The third, called the *mucous* layer, situated next the substance of the yelk, is generally in intimate connection with the vascular layer, and it is to the changes which these combined

Fig. 40.



A. Serous Layer.
B C. Vascular Layer.
D. Mucous Layer.
E. Heart.

layers undergo, that the intestinal, the respiratory, and probably also the glandular systems, owe their origin.' (A. Thompson, *op. cit.*, p. 298.)

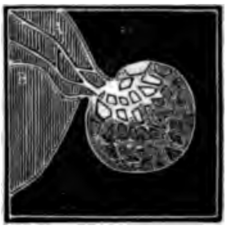
"The embryo is therefore formed in the layers of the germinal membrane, and becomes as it were, spread out upon the surface of the ovum: the changes which the ovum of mammalia undergoes appear, from actual observation, to be precisely analogous to those in the inferior animals. (*Baër*, *Prevost* and *Dumas.*) From the primitive trace, which was at first merely a line crossing the cicatricula, and which now begins rapidly to exhibit the characters of the spinal column, the parietes of the head and trunk gradually approach farther and farther toward the anterior surface of the abdomen and head until they unite; in this way the sides of the jaws close in the median line of the face, occasionally leaving the union incomplete, and thus appearing to produce in some cases the congenital defects of hair lip and cleft palate. In some way the ribs meet at the sternum; and it may be supposed that sometimes this bone is left deficient, and thus may become one of the causes of those rare cases of malformation, where the child has been born with the heart external to the parietes of the thorax. In like manner the parietes of the abdomen and pelvis close in the linea alba and symphysis pubis, occasionally leaving the integuments of the navel deficient, or, in other words, producing congenital umbilical hernia, or at the pubes a non-union of its symphysis with a species of inversion of the bladder, the anterior wall of that viscus being nearly or entirely wanting.

"The cavity of the abdomen is therefore at first open to the vesicula umbilicalis or yelk, but this changes as the abdominal parietes begin to close in; in man and the mammalia merely a part of it, as above mentioned, forms the intestinal canal, whereas, in oviparous animals, the whole of the yelk-bag enters the abdominal cavity, and serves for an early nutriment to the young animal. Another change connected with the serous or outer layer of the germinal membrane is the formation of the *amnion*. The fetal rudiment, which from its shape has been called *carina*, now begins to be enveloped by a membrane of exceeding tenuity, forming a double covering upon it; the one which immediately invests the fetus is considered to form the future epidermis; the other, or outer fold, forms a loose sac around it, containing the liquor amnii. While these changes are taking place in the serous layer of the germinal membrane, and while the intestinal canal, etc., are forming on the anterior surface of the embryo, which is turned toward the ovum, by means of the inner or mucous layer, equally important changes are now observed in the middle or vascular layer. 'In forming this fold,' says Dr. A. Thompson, 'the mucous layer is reflected farthest inward; the serous layer advances least, and the space between them, occupied by the vascular layer, is filled up by a dilated part of this layer, the rudiment of the heart.' (*Op. cit.*, p. 301.)

"While this rudimentary trace of the vascular system is making its appearance, minute vessels are seen ramifying over the vesicula umbilicalis, forming, according to Baër's observations, a reticular anastomosis, which unites into two vessels, the vasa omphalo-meseraica. (*British and Foreign Med. Rev.* No. 1.) These may be demonstrated with great ease in the chick; the cicatricula increases in extent; it becomes vascular, and at length forms a heart-shaped network of delicate vessels, which unite into two trunks, terminating one on each side of the abdomen.

"The umbilical vesicle now begins to separate itself more and more from the abdomen of the fetus, merely a duct of communication passing to that portion of it which forms the intestinal canal. The first rudiment of the cord will be found at this separation; its fetal extremity remains for a long time funnel-shaped, containing, beside a portion of intestine, the duct of the vesicula umbilicalis, the vasa omphalo-meseraica (the future vena portæ), the umbilical vein from the collected venous radicles of the chorion, and the early trace of the umbilical arteries. These last named vessels ramify on a delicate membranous sac of an elongated form, which rises from the inferior or caudal extremity of the embryo, viz: the *allantois;* whether this is formed by a portion of the mucous layer of the germinal vesicle, in common with the other abdominal viscera, appears to be still uncertain: in birds this may be very easily demonstrated as a vascular vesicle arising from the extremity of the intestinal canal; and in mammalia, connected with the bladder by means of a canal called *urachus;* from its sausage-like shape, it has received the name of *allantois.*

FIG. 41.



B. Is a portion of the Convexity of the Amnion, upon which at A. is the Fundus of the diminutive Human Allantois.

C. The Duct of the Vesicula Umbilicalis, dividing into two intestinal portions; and beside this duct are two vessels which are distributed upon the Vesicula Umbilicalis and form a reticular Anastomosis with each other.—*From Baer.*

"The existence of an allantois in the human embryo has been long inferred from the presence of a ligamentous cord extending from the fundus of the bladder to the umbilicus, like the urachus in animals. But from the extreme delicacy of the allantois, and from its function ceasing at a very early period, it had defied all research, until lately, when it has been satisfactorily demonstrated in the human embryo by

Baër and Rathke. It occupies the space between the chorion and amnion and gives rise occasionally to a collection of fluid between these membranes, familiarly known by the name of the liquor amnii spurius, which, strictly speaking, is the liquor allantoidis.

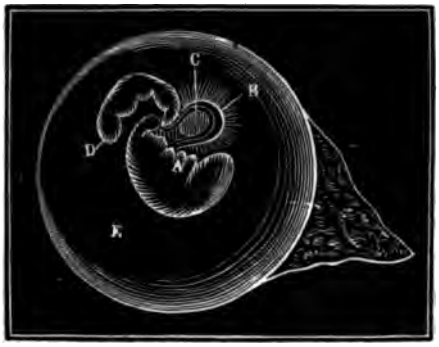
"The function of the allantois is still in a great measure unknown. In animals it evidently acts as a species of receptaculum urinæ during the latter periods of gestation; but it is very doubtful if this be its use during the earlier periods. It does not seem directly connected with the process of nutrition, which at this time is proceeding so rapidly, first by means of the albuminous contents of the vitellus, or vesicula umbilicalis, and afterward by the absorbing radicles of the chorion; but, from analogy with the structure of the lower classes of animals, it would appear that it is intended to produce certain changes in the rudimentary circulation of the embryo, similar to those which, at a later period of pregnancy, are effected by means of the placenta, and after birth, by the lungs, constituting the great functions of respiration.

"In many of the lower classes of animals, respiration (or at least the functions analogous to it), is performed by organs situated at the inferior or caudal extremity of the animal: thus, for instance, certain insect tribes, as in hymenoptera, or insects with a sting, as wasps, bees, etc.; in diptera, or insects with two wings, as the common fly; and also the spider tribe, have their respiratory organs situated in the lower part of the abdomen. In some of the crustacea, as, for instance, the shrimp, the organs of respiration lie under the tail, between the fins, and floating loosely in the water. Again, some of the mollusca, viz: the cuttlefish, have the respiratory organs in the abdomen. We also know, that many animals, during the first periods of their lives, respire by a different set of organs to what they do in the adult state; the most familiar illustration of this is the frog, which, during its tadpole state, lives entirely in the water.

"As the growth of the embryo advances, other organs, whose function is as temporary as that of the allantois, make their appearance: these also correspond to the respiratory organs of a lower class of animals, although higher than those to which we have just alluded—we mean branchial processes, or gills. It is to Professor Rathke (*Acta Naturæ Curios.*, vol. xiv), that we are indebted for pointing out the interesting fact, that several transverse, slit-like apertures may
detected on each side of the neck of the embryo, at a very early
of development. In the chick, in which he first observed it. "
place about the fourth day of incubation: at this peri
remarkably thick, and contains a cavity which communi

with the esophagus and stomach, and opens externally on each side by means of the above-mentioned apertures, precisely as is observed in fishes, more especially the shark tribe; these apertures are separated from each other by lobular septa, of exceedingly soft and delicate structure. Rathke observed the same structure in the embryo of the pig, and other mammalia: and Baër has since shown it distinctly in the human embryo. It is curious to see how the vascular system corresponds to the grade of development then present: the heart is single, consisting of one auricle and one ventricle; the aorta gives off four delicate, but perfectly simple branches, two of which go to the right, and two to the left side; each of these little arteries passes to one of the lobules, or septa, at the side of the neck, which correspond to gills, and having again united with three others, close to what is the first rudiment of the vertebral column, they form a single trunk, which afterward becomes the abdominal aorta. In a short time these slit-like openings begin to close; the branchial processes or septa become obliterated, and indistinguishable from the adjacent parts; the heart loses the form of a single heart; a crescentic fold begins to mark the future division into two ventricles, and gradually extends until the septum between them is completed. It is also continued along the bulb of the aorta, dividing it into two trunks, the aorta proper, and pulmonary artery; at the upper part the division is left incomplete, so that there is an opening from one vessel to the other, which forms the ductus arteriosus.[*] A similar process takes place in the auricles, the foramen ovale being apparently formed in the same manner as the ductus arteriosus; these changes commence in the human embryo about the fourth week, and are completed about the seventh.

FIG. 42.



A. Branchial Processes. D. Allantois.
B. Vesicula Umbilicalis. E. Amnion.
C. Vitellus. *From Baer.*

"At first the body of the ore elongated form than
afterward, and the part d is the trunk, at the
upper extremity of which hick than the middle
part, and separated from indentation, distin-

---

[*] In making these ob- iosus, we must
request our readers to

guishes the head. There are as yet no traces whatever of extremities, or of any other prominent parts; it is straight, or nearly so, the posterior surface slightly convex, the anterior slightly concave, and rests with its inferior extremity directly upon the membranes, or by means of an extremely short umbilical cord.

"The head now increases considerably in proportion to the rest of the body; so much so, that at the beginning of the second month, it equals nearly half the size of the whole body: previous to, and after this period, it is usually smaller. The body of the embryo becomes considerably curved, both at its upper as well as its lower extremity, although the trunk itself still continues straight. The head joins the body at a right angle, so that the part of it which corresponds to the chin is fixed directly upon the upper part of the breast; nor can any traces of neck be discerned, until nearly the end of the second month.

"The inferior extremity of the vertical column, which at first resembles the rudiment of a tail, becomes shorter toward the middle of the third month, and takes a curvature forward under the rectum. In the fifth week the extremities become visible, the upper usually somewhat sooner than the lower, in the form of small blunt prominences,—the upper close under the head, the lower near the caudal extremity of the vertebral column. Both are turned somewhat outward, on account of the size of the abdomen; the upper are usually directed somewhat downward, the lower ones somewhat upward.

"The vesicula umbilicalis may still be distinguished in the second month as a small vesicle, not larger than a pea, near the insertion of the cord, at the navel, and external to the amnion. From the trunk, which is almost entirely occupied by the abdominal cavity, arises a short, thick umbilical cord, in which some of the convolutions of the intestines may still be traced. Beside these, it usually contains, as already observed, the two umbilical arteries and the umbilical vein, the urachus, the vasa omphalo-meseraica, or vein and artery of the vesicula umbilicalis, and perhaps, even at this period, the duct of communication between the intestinal canal and vesicula umbilicalis, the fetal extremity of which, according to Professor Oken's views, forms the processus vermiformis.

FIG. 43.

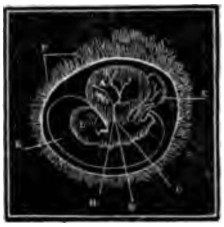


DIAGRAM OF THE FETUS AND MEMBRANES, ABOUT THE FOURTH WEEK.

A. Vesicula Umbilicalis, already passing into the ventricular and rectum intestine at G.
B. Vena and arteria Omphalo-meseraica.
C. Allantois springing from the Pelvis with the Umbilical Arterica.
D. Embryo.
E. Amnion.
F. Chorion.—*From Carus.*

"The hands seem to be fixed to the shoulders without arms, and

FIG. 44.

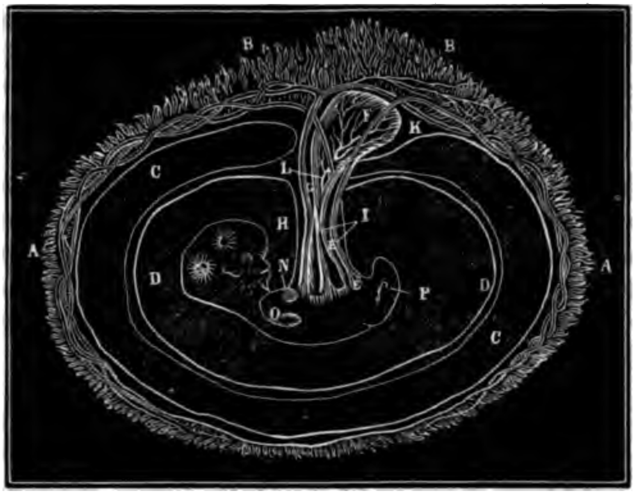


DIAGRAM OF THE FETUS AND MEMBRANES, ABOUT THE SIXTH WEEK.

A. Chorion.
B. The larger Absorbent Extremities, the Site of the Placenta.
C. Allantois.
D. Amnion.
E. Urachus.
E. Bladder.
F. Vesicula Umbilicalis.
G. Communicating Canal between the Vesicula Umbilicalis and Intestine.
H. Vena Umbilicalis.
I I. Arteriæ Umbilicales.
K. Arteriæ Omphalo-meseraicæ.
L. Vena Omphalo-meseraica.
N. Heart.
O. Rudiment of Superior Extremity.
P. Rudiment of Lower Extremity.—*From Carus.*

the feet to adhere to the ossa ilii; the liver seems to fill the whole abdomen; the ossa innominata, the ribs, and scapulæ, are cartilaginous.

"In a short time, the little stump-like prominences of the extremities become longer, and are now divided into two parts, the superior into the hand and the fore-arm, the inferior into the foot and leg; in one or two weeks later, the arms and thighs are visible. These parts of the extremities, which are formed later than the others, are at first smaller, but as they are gradually developed they become larger. When the limbs begin to separate into an upper and lower part, their extremities become rounder and broader, and divided into the fingers and toes, which at first are disproportionately thick, and until the end of the third month are connected by a membranous substance analogous to the webbed feet of water-birds; this membrane gradually disappears, beginning at the extremities of the fingers and toes, and continuing the division up to their insertion. The external parts of generation, the nose, ears, and mouth, appear after the development of the extremities. The insertion of the umbilical cord changes its situation to a certain degree; instead of being nearly at the inferior extremity of the fetus, as at first, it is now situated higher up, on the anterior surface of the abdomen. The comparative distance between the umbilicus and pubis continues to increase, not only to the full period of gestation, when it occupies the middle point of the length of the child's body, as pointed out by Chaussier, but even to the age of puberty, from the relative size of the liver becoming smaller.

"Though the head appears large at first, and for a long time continues so, yet its contents are tardy in their development, and until the sixth month the parietes of the skull are in great measure membranous or cartilaginous. Ossification commences in the base of the cranium, and the bones under the scalp are those in which this process is last completed.

"The contents of the skull are at first gelatinous, and no distinct traces of the natural structure of the brain can be identified until the close of the second month; even then it requires to have been some time previously immersed in alcohol to harden its texture. There are many parts of it not properly developed until the seventh month. In the medulla spinalis no fibers can be distinguished until the fourth month. The thalami nervorum opticorum, the corpora striata, and tubercula quadrigemina, are seen in the second month; in the third, the lateral and longitudinal sinuses can be traced, and contain blood. In the fifth we can distinguish the corpus callosum; but the cerebral mass has yet acquired very little solidity, for until the sixth month it is almost semifluid. (Campbell's *System of Midwifery.*)

"About the end of the third, during the fourth, and the beginning of the fifth months, the mother begins to be sensible of the movements of the fetus. These motions are felt sooner or later, according to the bulk of the child, the size and shape of the pelvis, and the quantity of fluid contained in the amnion; the waters being in larger proportionate quantity the younger the fetus.

"The secretion of bile, like that of the fat, seems to begin toward the middle of pregnancy, and tinges the meconium, a mucous secretion of the intestinal tube, which had hitherto been colorless, of a yellow color. Shortly after this the hair begins to grow, and the nails are formed about the sixth or seventh month. A very delicate membrane (membrana pupillaris), by which the pupil has been hitherto closed, now ruptures, and the pupil becomes visible. The kidneys, which at first were composed of numerous glandular lobules (seventeen or eighteen in number), now unite, and form a separate viscus on each side of the spine; sometimes they unite into one large mass, an intermediate portion extending across the spine, forming the horseshoe kidney.

"Lastly, the testes, which at first were placed on each side of the lumbar vertebræ, near the origin of the spermatic vessels, now descend along the iliac vessels toward the inguinal rings, directed by a cellular cord, which Hunter has called *Gubernaculum testis:* they then pass through the openings, carrying before them that portion of the peritoneum which is to form their tunica vaginalis.

"The length of a full-grown fetus is generally about eighteen or nineteen inches; its weight between six and seven pounds. The different parts are well developed and rounded; the body is generally covered with the vernix caseosa;[o] the nails are horny, and project beyond the tips of the fingers, which is not the case with the toes; the head has attained its proper size and hardness; the ears have the firmness of cartilage; the scrotum is rugous, not peculiarly red, and usually containing the testes. In female children, the nymphæ are generally covered entirely by the labia, the breasts project, and in both sexes frequently contain a milky fluid. As soon as a child is born, which has been carried the full time, it usually cries loudly, opens its eyes, and moves its arms and legs briskly; it soon passes urine and fæces, and greedily takes the nipple. (Nægelè's *Hebammenbuch.*)

"Thus then, in the space of forty weeks, or ten lunar months, from an inappreciable point, the fetus attains a medium length of about eighteen or nineteen inches, and a medium weight of between six and seven pounds."

CHAPTER XXII.

POSITION, NUTRITION, RESPIRATION, CIRCULATION, DIMENSIONS, AND DEATH OF THE FETUS. SUPERFETATION.

It was formerly believed that the fetus in utero maintained a sitting *position* during the early months of pregnancy, and that as it progressed in its development, the superior weight of the head, effected a revolution, so that at the latter period of pregnancy its position was reversed, the head being downward; but this is incorrect, the position of the intra-uterine fetus remains unaltered from the commencement to the termination of gestation, no matter what may have been its primary or original position. Its usual position is with the head downward, the most dependent part being the vertex; the head is flexed forward so that the chin rests on the anterior superior portion of the breast; the thighs are drawn up toward the abdomen, with the knees apart from each other, and thrown upward so as to strongly flex the legs on the posterior surface of the thighs; the heels approximate at the posterior part of the thighs, the feet being usually crossed; the arms rest upon the sides of the thorax, while the fore-arms are flexed and crossed in front of the sternum; the neck and back are bent forward into a curve. In this position it constitutes an oval figure, whose long diameter is about eleven inches, and forms a line nearly parallel with the long diameter of the uterus; and we can not conceive of a more easy and compact position for such an irregular and bulky body.

---

[o] The vernix caseosa is a viscid, fatty matter, of a yellowish-white color, adhering to different parts of the child's body, and in some cases in such quantity as to cover the whole surface; it seems to be a substance intermediate between fibrine and fat, having a considerable resemblance to spermaceti. From the known activity of the sebaceous glands in the fetal state, and from the smegma being found in the greatest quantity about the head, armpits, and groins, where these glands are most abundant, there is every reason to consider it as the secretion of the sebaceous glands of the skin during the latter months of pregnancy.

The cause of the dependent position of the head, which is by far more common than any other, has given rise to much speculation; it has been supposed to be the result of gravitation—that the fetus being suspended by the umbilical cord, its heaviest extremity, the cephalic, would naturally fall downward. Again, it has been stated to depend upon the instinctive will of the fetus itself, which assumes the position as the most convenient for its intra-uterine existence, and as the most advantageous for an easy expulsion. Various other reasons have been given, but none of them are satisfactory, and the subject remains in as much obscurity as ever.

The principal functions of the fetus while in its intra-uterine condition, are nutrition, respiration, and circulation, upon each of which a brief notice will be bestowed. In relation to the first, *nutrition*, many hypotheses have been advanced; it is at present supposed that during the early embryonic life, nourishment is accomplished by superficial imbibition, or probably by absorption through the villi of the chorion, and that its sources are, at first, the vitellus, or the liquid in the umbilical vesicle, and perhaps the albuminous matter existing between the amnion and chorion; the amniotic liquid, after its formation, is also considered to contribute much toward this end, as it contains several nutrient principles. It is probably absorbed by the cutaneous surface, for acephalous fetuses, and those with the natural mucous orifices closed, as well as those which have been born without a placenta or umbilical cord, have been, with these exceptions, as well developed as the perfectly-formed fetus. It has also been stated that this fluid is probably swallowed, or conveyed into the digestive tube, from the fact that hair and portions of epithelium have been found mixed with it in the stomach; and the meconium is supposed to be the result of digestion. It has also been suggested by Dr. Montgomery, that the milky liquid in the decidual cotyledons, may assist in the nourishment of the fetus. The placenta has likewise been thought to assist during the latter months of pregnancy, but this is rather designed for hematosis than nutrition, and acts as a substitute for the undeveloped lungs of the fetus, somewhat in the manner of the gills of fishes, whose blood is aërated by the water passing through them. It must be remembered that fetal nutrition has continued in instances where the liquor amnii had been evacuated for weeks, which would seem to indicate some other source of nutrition; beside, although meconium, hair, etc., have been found in the digestive tube, still it appears to me that the function of deglutition must be very difficult to perform in cases where inspiration and expiration are absent, as with the fetus. It will thus be seen that the subject of fetal nutrition is involved in great obscurity.

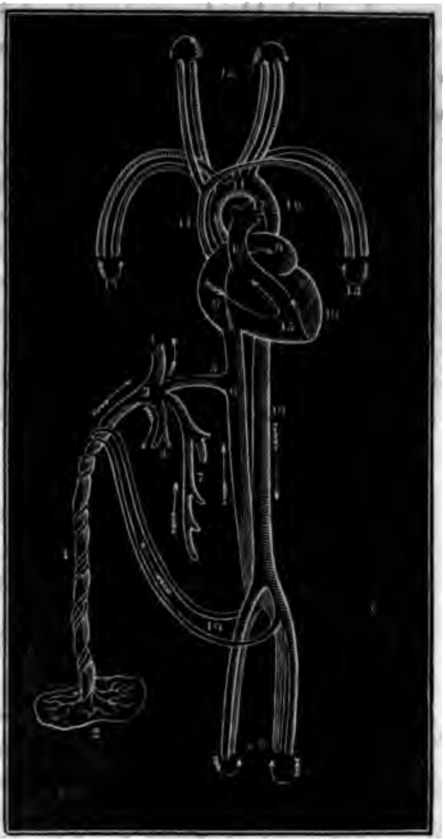
By FETAL RESPIRATION, is meant, not the inhalation and exhalation of atmospheric air, such as takes place after birth, but the phenomenon by which the blood in the placenta is modified to suit it for the purposes of fetal life. As with the function of nutrition, this is also an unsettled and incomprehensible subject. It is supposed, that although the placenta may be the medium by which a vivifying principle is taken from the maternal blood and conveyed to the fetal, yet the materials which form in the latter and become unsuited to nutrition, are not removed by the placenta alone, but principally by the liver, which employs the superabundance of carbon and hydrogen to form bile, as well as to aid in perfecting its own development. Respiration and nutrition appear to exist together, acting in harmony, without disturbing each other, and both being, probably, performed, through a similar means, that of absorption.

In the FETAL CIRCULATION, there are several anatomical peculiarities, not existing in the adult, which it may be proper to notice: 1. There is a vein termed the *ductus venosus*, which is situated at the thick edge of the liver, and communicates between the umbilical vein and the vena cava ascendens or inferior vena cava; after birth this vein contracts, closes on the seventh day, and becomes obliterated. 2. In the center of the septum, between the auricles, is an oval aperture, called the *foramen ovale* or *foramen of Botal;* this is furnished with a valve, which it is stated allows the blood from the vena cava ascendens to pass into the left auricle, without mingling with the blood of the vena cava descendens; after birth, this closes, rarely persisting beyond seven or eight days—occasionally it remains unclosed during life, giving rise to a morbid condition known as morbus cœruleus. 3. Soon after the origin of the pulmonary artery, a branch is given off, which communicates between this artery and the aorta, entering this latter just below its transverse arch; it is called the *ductus arteriosus*, and after birth gradually closes and becomes obliterated. 4. The *umbilical arteries* and *umbilical vein* have been already referred to.

The fetal circulation is entirely independent of that of the mother, its blood resembles venous blood, being of a uniform dark color, and becoming of a bright florid tint as soon as exposed to the atmosphere; it contains less fibrin than adult blood, but coagulates on standing; no difference can be perceived between the color of the fluid passing in the umbilical arteries and that in the umbilical vein. Under the microscope it presents corpuscles, resembling those seen in the blood of an adult.

The course of the circulation is as follows: The blood is conveyed from the ramifications of the umbilical vein in the placenta to this vein, through which it passes, traversing its whole length, to the umbilicus; as soon as it has entered into the abdomen through the umbilical ring, it proceeds to the longitudinal sinus, or fissure of the liver, where a portion of it flows into the ductus venosus which conveys it immediately to the vena cava ascendens; while the remainder passes into the liver, circulates through it, and flows into the hepatic veins where it is collected and also emptied into the vena cava ascendens, just as it is traversing the diaphragm. It is from thence conducted, together with the blood conveyed through the ductus venosus, to the right auricle of the fetal heart, where it meets and probably mixes with the blood from the vena cava descendens; a portion of it flows into the right ventricle, while the major portion passes through the foramen ovale into the left ventricle, which throws it into the aorta, through which it is distributed to all parts of the body, but especially to the head and superior extremities. It returns from these superior parts through the jugular and axillary veins, passes into the subclavians, and then into the vena cava descendens through which it flows into the right auricle, then into the right ventricle, and, together with that portion which passed into the right ventricle without having entered the foramen ovale, is thrown into the pulmonary artery, from which a portion is conveyed to the lungs, while the major part passes through the ductus arteriosus into the descending aorta, where it mixes with the blood from the left ventricle, not required for the head and superior extremities, and flows along with it down the descending aorta. That portion which entered the lungs through the pulmonary artery returns by the pulmonary veins to the left auricle, and thence to the left ventricle, and into the descending aorta, where it mixes as just stated above. A part of the blood in the descending aorta is distributed to the viscera and inferior extremities, while the larger portion returns to the placenta, through the umbilical arteries, there to be revivified, and be again taken up by the umbilical vein to traverse the same route as before (*Fig.* 45).

Fig. 45.



EXPLANATION OF THE *FŒTAL* CIRCULATION.

1. The Umbilical Cord, consisting of the Umbilical Vein and two Umbilical Arteries.
2. The Placenta.
3. The Umbilical Vein dividing into three branches.
4 4. Two branches of the vein to be distributed to the Liver.
5. Ductus Venosus, or third branch of the Umbilical Vein.
6. The Inferior Vena Cava into which the Ductus Venosus enters.
7. Portal Vein, which returns the blood from the intestines, and unites with the right Hepatic branch.
8. Right Auricle, through which the blood passes to the left Auricle.
9. Left Auricle.
10. Left Ventricle, through which the blood passes to the arch of the Aorta.
11. Arch of the Aorta, from which the blood is distributed, through its branches, to the head and upper extremities.
12 12. The Arrows represent the return of the blood from the head and superior extremities through the Jugular and Subclavian Veins to
14. The Superior Vena Cava, to the right Auricle, and in the course of the Arrow, through
15. The Right Ventricle to
16. The Pulmonary Artery.
17. The Ductus Arteriosus, a proper continuation of the Pulmonary artery; the commencement of the right and left Pulmonary Artery, are seen on each side.
18 18. The descending Aorta, joined above by the Ductus Arteriosus; further down it divides into the common Iliacs, which become the Umbilical Arteries.
19. The Umbilical Arteries which return the blood along the cord to the Placenta, while the External Iliacs are continued to the lower extremities.
20. The External Iliacs; the Arrows marking the return of the venous blood by the Veins to the Inferior Cava. (*Neill and Smith.*)

From this arrangement of the circulation, it will be seen that the blood with which the head and superior extremities are furnished, is nearly fresh and pure from the placenta, while that flowing through the inferior parts of the fetus, having previously circulated through the system, must be less pure; and this may, probably, be a reason why the head and superior extremities are more rapidly developed than the inferior portions of the fetus.

Previous to birth, the proper functions of the lungs are not required, and they are small, dense, firm, and unaërated, being nourished by small branches passing from the pulmonary artery; but after birth, considerable change ensues, the lungs become more or less inflated with atmospheric air, and pulmonary circulation is established. The foramen ovale is closed by the valve perfected for this purpose, which closure propels all the blood, entering the right auricle, from the ascending and descending cava, immediately into the right ventricle; from thence it is propelled into the pulmonary arteries (which increase in diameter), and passes into the lungs, where, from the action of the atmospheric oxygen, it is converted into arterial blood. The ductus arteriosus being now useless, gradually contracts and disappears. The blood from the inferior extremities, not being able to pass through the umbilical arteries, flows through the vena cava ascendens into the right auricle and ventricle of the heart, thence, as above, into the lungs, and the circulation becomes changed from that of the intra-uterine to that of the extra-uterine or adult. In addition, other changes also occur, the liver becomes more active, the excretory functions of the kidneys and intestinal canal become established, and proper digestion of the food received into the stomach takes place.

The *dimensions*, *appearances*, and *weight* of the fetus at different periods of its intra-uterine development, have been somewhat accurately ascertained by various investigators; and as it is not only a matter of mere curiosity, but frequently, one of great practical importance, in a medico-legal sense, to determine the age of the expelled fetus, it is necessary that the student should be informed on these points. The following summary of statements of various observers are therefore presented:

The first distinct microscopic view which can be had of the embryo is about the *third* or *fourth week;* it is oblong, swollen in the middle, bluntly pointed at one extremity, obtuse at the other, and is slightly curved forward; it is semi-opaque, of a gelatinous consistence, grayish-white color, varying from two to five lines in length, and weighing one or two grains. It is surrounded by the amnion, and has a vermiform or serpent-like appearance. Its head appears as a small tubercle, separated from the body by a notch; its mouth is indicated by a cleft; its rudimentary eyes by two black points; its caudal extremity is slender, and a white line may be observed in it, which indicates the continuation of the medulla spinalis. The members present nipple-like protuberances; the liver occupies the whole abdomen, the cavity of which is opened in front to a considerable extent; the umbilical vesicle is very large; the chorion is villous, the villosities being diffused over its whole surface.

At the *sixth week*, its length is from nine to twelve lines; its weight from forty to seventy-five grains; and all its parts are distinct. The head has greatly increased, and is separated from the thorax by the depression of the neck; the eyes still appear as two dark spots; the mouth presents a small, triangular orifice; the face is distinct from the cranium; the hands, fore-arms and fingers can be recognized; the clavicle and maxillary bone present a point of ossification; the legs and feet are situated near the anus, which remains closed; the umbilicus, for the attachment of the cord, may be observed, the cord consisting of the omphalo-mesenteric vessels, a portion of the urachus, a part of the intestinal tube, and of filaments, which represent the umbilical vessels; the formation of the placenta commences; the chorion and amnion are separated from each other; and the umbilical vesicle is very large. The divisions of the vertebræ can be seen, also the imperfect interventricular septum of the heart, and the lungs, which appear as five or six lobules, in which the bronchii may be distinguished terminating in somewhat swollen cul-de-sacs. Extending from the lung to the bottom of the pelvis, along each side of the vertebral column, may be seen two glandular structures; these are the Wolffian bodies, or *false kidneys*, and are constituted of an excretory canal running through their whole length. Alongside of this canal may be observed another, which becomes, according to the gender of the new being, either the oviduct or the vas deferens. Both of these canals empty below into the transitory pouch or cloaca.

In early embryonic life may be seen on each side of the neck four transverse fissures; these open into the pharynx, are separated from each other by fleshy bands, and are analogous to the bronchial arcs of fishes. The aorta sends three or four branches to these fissures, but which, together with the fissures soon become obliterated, but two on the left side remaining, one of which becomes the arch of the aorta, while the other forms the common trunk of the pulmonary arteries; the first branchial fissure of each side also remains, and is converted into the external ear. The upper jaw is composed of a pimple or piece on each side, which gradually approximate and form a single body; the nostrils are each split down to the mouth, and are separated by the incisive pimples, but approach each other, and assume their proper form, as the pimples diminish in size; and if the progress of this development is arrested, hare-lip is the result.

At *two months*, the embryo is from one and a half to two inches in length, and weighs from three drachms to nearly an ounce; the head forms about one-third of it, the eyes are prominent but not yet covered by the lids, which are still rudimentary; the nose forms an obtuse eminence, with rounded and separated nostrils; the mouth is gaping; the elbows and fore-arms are detached from the trunk, and the fingers are isolated, or adhere by a transparent gelatinous substance; the rudimentary shoulders and hips are just observable; the penis or clitoris is apparent, but can not readily be distinguished from each other, on account of the length of the latter. The anus forms a small conical projection, but is imperforate, and its location is marked by a dark spot; the rudiments of the lungs, spleen, and supra-renal capsules are observed; the cœcum is placed behind the umbilicus; the digestive tube is withdrawn into the abdomen; the urachus is visible; osseous points are apparent in the frontal bone and in the ribs; the chorion commences to come in contact with the amnion at the point opposite the insertion of the placenta, which now begins to assume its regular form; the cord is inserted low down in the abdomen, is infundibuliform in shape, and four or five lines in length, and the umbilical vessels commence their spiral twisting; its base contains a portion of intestine. The umbilical vesicle begins to disappear. The epidermis is distinguishable.

At *ten weeks*, the embryo is from one and a half to two and a half inches in length, and weighs an ounce, or an ounce and a half; the eyelids are apparent and cover the eyes, and the lachrymal puncta are visible; the hips commence to develop themselves, and the buccal fissure begins its obliteration. The parietes of the thorax are seen, and the motions of the heart are no longer visible; the fingers are distinct, and the toes appear as tubercles united by some soft substance; the cord assumes the spiral appearance, is longer than the embryo, is less infundibuliform, is not inserted so low down, and still contains a portion of intestine.

At *three months*, the embryo is from two and a half to five or six inches in length, and weighs from an ounce and a half to three or four ounces; the head is voluminous, but bears a better proportion to the rest of the body; the eyelids are very distinct, and are in contact by their free margins; the pupillary membrane is visible; the nose projects; the mouth is closed but perfectly delineated; the thorax is well formed; the fingers are completely separated, and the [illegible]ment the appearance of thin membranous plates; the inferior extremities are of greater length than the rudimentary tail; the clitoris and penis are very long, but the sex may frequently be discriminated by a longitudinal fissure, the edges of which form the labia pudenda; the thymus gland, as well as the supra-renal capsules are present; the cœcum is placed below the umbilicus; the cerebrum is five lines in diameter, the cerebellum four, the medulla oblongata one and a half, and the medulla spinalis three-fourths of a line; the two ventricles of the heart are distinct; the decidua reflexa and vera come in contact; the cord contains a little of the gelatin of Wharton, and umbilical vessels which twist and form long spiral turns; the placenta becomes completely isolated, and the allantois, umbilical vesicle, and omphalo-mesenteric vessels have disappeared.

At *four months*, the embryo takes the name of Fetus. Its length is from five to eight inches, and its weight from three to seven or eight ounces. The skin is rosy, tolerably dense, and begins to be covered with down; and a sensible motion may be perceived in the muscles. The fontanelles and sutures are very large, and sometimes whitish hairs may be seen on the head; the face is elongated but imperfectly developed; the eyes, nostrils, and mouth are closed, and the tongue and projection of the chin are observable; the membrana pupillaris is very evident; the nails become more developed; the sex may be recognized; the cœcum is placed near the right kidney; the gall-bladder commences to appear; meconium is found in the duodenum; the cœcal valve is visible; the umbilicus is placed near the pubis; the ossicula auditoria is ossified; the superior part of the sacrum presents points of ossification; the decidua serotina is formed; and the chorion and amnion are in close contact with each other. A fetus born at this period might live for several hours.

At *five months*, the length of the fetus is from seven to ten inches, and its weight from seven to twelve ounces. The head is still large, with appearances of hair; white substance in the cerebellum; the nails are very distinct; the skin is more consistent, frequently presenting patches of sebaceous matter; the heart and kidneys are very voluminous; the cœcum is situated at the inferior part of the right kidney; the gall-bladder is distinct; points of ossification are manifest in the pubis and heel; germs of permanent teeth appear; the meconium has a yellowish-green tint, and occupies the commencement of the large intestine; the umbilical cord is longer.

At *six months*, the length of the fetus is from ten to twelve and a half inches, and its weight from twelve ounces to a pound. The hair is longer and thicker, white or silvery; the face of a purplish-red; the eyelids somewhat thicker but still in contact, the pupillary membrane also remains, and the eyebrows are filled with delicate hairs. The skin is better organized, presenting some appearance of fibrous structure, and sebaceous covering; the nails are solid; sacculi begin to appear in the colon; the cord is inserted a little above the pubis; the scrotum is very small, quite red, and empty, the testes being near the kidneys; points of ossification are developed in the divisions of the sternum.

At *seven months*, the fetus is from twelve and a half to fourteen inches in length, and weighs three or four pounds. All its parts are more perfectly developed and better proportioned; the brain possesses more consistency; the skin is rosy, thick and fibrous, with sebaceous covering; the eyelids are partly open; the pupillary membrane disappears; the iris commences as a simple ring, which increases in a concentric manner, ultimately leaving an opening called the pupil; the nails have not yet reached the extremities of the fingers; a point of ossification is observed in the astragalus; the left lobe of the liver is nearly as large as the right; the gall-bladder contains bile; nearly the whole of the large intestine is filled with meconium; valvulæ conniventes begin to appear; the cœcum is placed in the right iliac fossa; the testicles leave the kidneys and approach the inguinal ring.

At *eight months*, the fetus is from fourteen to sixteen or eighteen inches in length, and weighs four or five pounds. The skin is very red, covered with long down, and a quantity of sebaceous matter, called the *vernix caseosa*, or *smegma*, which is a secretion of the fetal skin, and is found more abundantly on some fetuses than on others; it is a fat, slippery, viscous substance, of a yellowish white color, is insoluble in water, alcohol or oil, and only partially soluble in potash, and is apparently of service, during labor, by aiding to facilitate the expulsion of the fetus. The pupillary membrane disappears; convolutions appear in the brain; the inferior maxillary bone, which was at first very short, is now as long as the superior; the nails are much firmer and reach the extremities of the fingers; a point of ossification is observed in the last vertebra of the sacrum; no center of ossification is presented by the cartilage of the inferior extremity of the femur; the testicles descend into the internal ring, and one is usually contained in the scrotum, generally that on the left side; the hair of the head is much darker and longer.

At *full term*, the fetus is from sixteen to twenty-three inches in length, and weighs from five to seven, ten, and sometimes even twelve pounds, the average weight being about six and a half pounds. The head is covered with a greater or less quantity of hair, varying in length from six to twelve lines; the white and gray substances of the brain become distinct; the pupillary membrane no longer exists; four portions of the occipital bone remain distinct; the external meatus auditorius still remains cartilaginous; the os hyoides is not yet ossified; the skin is covered with sebaceous matter, especially at the flexures of the joints; the liver descends to the umbilicus; the testes have passed the inguinal ring, and are frequently found in the scrotum; meconium is found at the termination of the large intestine; the center of the cartilage at the lower extremity of the femur, exhibits a point of ossification.

A full developed fetus is characterized by a ready movement of the limbs, an ability to cry, and a capability of sucking; its mouth, eyelids, nostrils and ears are open; the hair, eyebrows and nails are fully developed; the cranial bones are firm, and the edges of the fontanelles are not far apart, the body is of a clear red color; and the meconium is discharged within a few hours after birth. The meconium is a semifluid, of a dark green color at term, which is found in the fetal intestines, and is a mixture of bile with the secretions of the mucous membrane; some suppose it to be digested amniotic fluid.

An immature fetus may be known by its feeble motions, its small size, and incapability of sucking; its head is covered with down or sparingly with short hair; the bones are soft; the fontanelles widely separated; the skin is red with blue streaks; the nails are not perfected; the eyelids and mouth are closed; and the urination and defecation are imperfect.

As already remarked when treating of abortion, the fetus is liable to numerous diseases, some of which may be independent of the condition of the mother, while others occur secondarily through her. Cases of intermittent fever have occurred to the fetus where the mother was laboring under the disease; small-pox has attacked the fetus both where the mother was suffering with it, and in other instances where she was entirely exempt from it, and the same may be said of measles. Various cutaneous diseases have also attacked the fetus in utero, as well as hydrocephalus, pleurisy, abscesses of the lungs, œdema, scirrhous induration, tubercles, lobular pneumonia, calcareous deposition in
lungs, peritonitis, and enteritis. It is also especially liable to
trophy or atrophy, worms, calculus, dropsy, rickets, caries and
Various forms of syphilitic disease are very apt to injure o
when the system of one or both parents is contaminated w
litic virus. The heart, liver, kidneys, stomach, and oth
become organically affected, and it is by no means unco
fractures and dislocations of various bones, which too
birth. Previous to the expulsion of the fetus, it

any of these maladies, and even had we the means of doing so, it is very doubtful whether any curative or even palliative measures could be beneficially pursued; the greater part of them may be ascertained after its death and expulsion, and all the advantage to be derived from such information, at this time, is to lead to the adoption of such measures as may prevent similar attacks in subsequent pregnancies.

The *signs* by which we may determine the *death of the fetus*, are frequently of great importance, especially in reference to the best time for obstetric operations, when these have to be performed. There are no signs upon which, separately, the accoucheur can positively determine a dead fetus; indeed its diagnosis is extremely difficult, and must be decided by the aggregate of symptoms present. These are named by Dr. Churchill, in his work on Obstetrics, as follows:

1. *The cessation of the fetal movements;* but these may be suspended for several days, and yet the fetus be alive. 2. *The subsidence* or *flaccidity of the abdomen;* this varies much during pregnancy, less tension being present in women who have had several children. 3. *The recession of the umbilicus;* but a dead fetus may remain in utero for months without this sign. 4. *The loose feel of the uterine tumor.* 5. *A rolling of the tumor in the abdomen,* and a *sensation of dead weight and coldness;* these may exist and yet the fetus be alive, the rolling may proceed from a loss of tone of the abdominal muscles—women who give birth to a living child, frequently complain of the uterine tumor feeling as a weight or foreign body; again, there is no appreciable difference between the temperature of a living fetus and that of a dead one—the coldness is a mere sensation that may be experienced independent of fetal death. 6. *The breasts* suddenly become flaccid, and their secretion suppressed; this rarely occurs from any cause save the death of the fetus. 7. *The health of the female becomes deteriorated;* but a dead fetus has frequently been retained for weeks or months without any change in the maternal health, beside the health may be impaired from other causes. 8. *Bad appetite, sunken countenance, a dark areola around the eyes; fetid breath, repeated rigors;* these are all minor signs, and may exist independent of pregnancy, or when occurring during its presence may be owing to causes not connected with the condition of the fetus; yet taken in connection with other signs they may become useful in aiding the diagnosis.

When the motions of the fetus have been very active up to the fifth, sixth or seventh month, or longer, and suddenly subside, and at the same time the breasts which had been firm and tense, become flaccid and decrease in size, while the abdomen loses its previous tense and rounded form, the uterine tumor becoming weighty and rolling loosely in the lower belly, we have almost a positive proof of the death of the fetus, which is rendered still more certain by the absence of the beating of the fetal heart. But, although much assistance may be derived from the use of the stethoscope, yet it frequently proves uncertain, either from want of tact and experience on the part of the auscultator, or because the position of the fetus may be unfavorable to the transmission of sound to his ear, or the pulsations may be temporarily suspended. If, however, the pulsations have been distinctly heard on a previous occasion, and subsequently become suddenly or gradually inaudible, the evidence in favor of the death of the fetus, in connection with the other symptoms, is rendered unequivocal.

After the rupture of the membranes, there are other diagnostic symptoms of a more determinate character. 1. The liquor amnii becomes dark, thicker than usual, fetid, and bloody, especially where the fetus has been dead for some time; but it must be remembered that these conditions have been present with the living fetus. 2. When the death is not recent, having occurred some time previous to the examination, the scalp will feel emphysematous when the finger is pressed upon it, crepitating under the touch, and a portion of the cuticle will peel off; where the death is recent, the bones of the skull will overlap each other loosely, and the edges of the bones will convey a sensation of peculiar sharpness. These, together with the absence of pulsation at the anterior fontanelle, and its decrease from the collapse of the bones, are considered conclusive signs.

In *face presentations*, the flabby lips, flaccid and motionless tongue, and a slight swelling of the presenting part, are evidence of the child's death. In *breech presentations*, the finger can be readily introduced within the sphincter ani in case of death, which contracts and resists the finger, if the fetus be alive; the discharge of meconium is a symptom of no value. In an *arm presentation*, the pulse at the wrist may be imperceptible, the arm may become cold and livid, and yet the fetus be alive; but if the epidermis peel off, the child is dead. In *prolapse of the umbilical cord*, the absence of pulsation in it is usually regarded as conclusive evidence of the child's death; but this has occurred and the child been born alive.

Before closing this part of the work, I will make a few remarks on *superfetation*, which subject has not been noticed in the preceding pages. By superfetation is meant, a second impregnation and conception, where the female is already pregnant. The early writers were impressed with the belief, that such an occurrence was possible, while among recent authors we find a difference of opinion. The reasons which have been advanced in its favor, are: 1. Females, at full term of pregnancy, sometimes give birth to a well-developed fetus, and a blighted ovum at the same time; or, where the children are living, one of them will be more matured than the other. The disparity between them has afforded ground for belief that they were the products of different impregnations; but these cases do not prove superfetation, as it not unfrequently occurs that the development of one of the twins is retarded, or it may die and be expelled while the other is retained; and it is by no means uncommon, for one twin to be larger and more matured than its fellow.

2. Cases have been recorded where the female has brought forth, at one parturition, two children, one of which was white, and the other black, or mulatto. But these cases have, so far as I know, been the result of two coitions, shortly succeeding each other, one with a white, and the other with a black person. There is abundant evidence to prove, that superfetation of this kind, is possible at a very early period of pregnancy; impregnation having taken place before the formation of the membrana decidua, or before the canal of the cervix became closed by the tough, gelatinous secretion of the glandulæ Nabothi. But after the formation of these substances, which effectually prevents any egress into the uterus, I do not believe that conception can occur, unless, indeed, there be some other route by which the semen can reach the ovaries, independent of the uterine cavity, and Fallopian tubes.

3. Instances have been related where from three to four months after the delivery of a well-developed child, another child, as fully matured, has been born. In some of these cases, the difficulty has been removed by the discovery of a double uterus. But, where these circumstances have happened with but a single uterus present, the subject is involved in much obscurity. It may be that the development of one fetus progressed much more slowly than that of the other; and when this latter was born, the uterine contractions having neither destroyed the integrity of the membranes of the former, nor injured its utero-placental connection, it continued to remain in utero, until from size, weight, etc., the uterus was again called into action. It has also been supposed in cases of single uterus, that this organ may have been divided by a longitudinal septum, and impregnation effected in each at different periods; but this is as difficult, to my mind, as in the previous instance, unless it be admitted in each, that immaturity of the fetus favors protracted gestation, and that the contractions of the uterus, to expel a full grown fetus, do not, necessarily, involve the immediate expulsion of another in utero, but imperfectly developed.

PART III.

OF LABOR, OR PARTURITION.

CHAPTER XXIII.

LABOR.

Labor, or **Parturition**, is that function by which the matured fetus, together with its secundines, are expelled from the uterus; it occurs at the end of nine calendar months and one week, or about two hundred and eighty days from the last menstrual appearance, and about one hundred and forty days after quickening. A few days, either previous or subsequent to this time, constitute no material difference. At this period, the hitherto inactive nervous and muscular systems of the uterus become stimulated into action, causing contractions of this organ, which are always accompanied with pain, in a greater or less degree, and which cease only when the uterus has expelled its contents; as the contractions are invariably attended with pain, the terms, *labor pains*, and *uterine contractions* are employed synonymously. As a general rule, labor, though painful and exposed to danger, may be expected to terminate favorably, and without artificial aid. The average duration of labor is six hours, or, according to some authors, four, but which depends upon the amount of power in action, and the degree of resistance which is presented. Cases have been known, in which labor has been completed in ten or fifteen minutes, while with others, again, from four to seven, and even ten days have passed, before the fetus has been expelled into the world. The i[illegible]tions of M. Quetelet, Dr. Buck, and othe indicate that more [illegible]cur at night than during the day, being five children born at night, for every four born during the day; and also, that the least number of births occur at midnight, and at noon. Yet these day-births may, in many instances, require the attention of the accoucheur during the night.

The *immediate*, or *exciting cause* of labor, is not satisfactorily understood, though physiologists of all ages have advanced various theories. Thus, some have attributed it to a supposed struggling of the fetus, in an endeavor to procure a more adequate amount of nourishment than is received while within the uterus; others again, have supposed it to depend upon the motions of the fetus, in seeking to relieve itself from its constrained position, to remove itself to a less elevated temperature; or, to obtain access to the atmosphere for the purpose of breathing. But these, or any other theories which suppose the fetus to be the principal agent in its own expulsion, are now known to be incorrect; the fetus is merely a passive agent in parturition, and a dead one is expelled as easily as one living. Some, viewing the uterus alone as possessing the power necessary to effect labor, have supposed, that when no further development of uterine fiber can take place, the contractions ensue; others assert, that they commence as soon as the antagonizing condition, which exists between the fibers of the cervix and those of the fundus, are overcome, the latter having the preponderance of action. But it is unnecessary to enter into an explanation of all the views which have been promulgated on the subject; suffice it to say, that they are all unsatisfactory, and we are compelled to admit with Avicenna, an Arabian physician of the eleventh century, "that at the proper time, labor comes on, by the grace of God;" or, as a medical man once remarked, "it is involved in as much obscurity as the cause why peaches ripen in August, and strawberries in June." But though the researches of physiologists have failed to discover the exciting cause of labor, they have established the fact, that as with all other uterine functions, periodicity exists in this also; as labor manifests itself at a period corresponding to that of menstruation, and which, but for the conception, would have been a menstrual term.

The principal agents, in the accomplishment [illegible] contractions of the muscular fibers of the uterus, [illegible] during the second stage, by the diaphragm and [illegible] the expulsory efforts of all these agents final
tion of the uterine cavity, which, when
its non-gravid state, measuring from
length, about an inch and a half in

an inch in thickness. The pain, which attends each uterine contraction, is owing to the pressure these contractions exert upon the nerves of the uterus, and also to the constant traction upon the circular fibers of the cervix, by the longitudinal fibers.

The PREMONITORY SIGNS OF LABOR are several; a *subsidence, or sinking down of the uterus* in the abdomen, is the first, and probably most striking; the uterus, which had previously extended to the epigastric region, sinks lower, and appears to spread out laterally. This symptom may occur as early as two weeks previous to the first pains of parturition, but usually, it is observed only a few days before. The mechanical impediment to respiration being thus removed, the female experiences much relief, she respires with greater ease, feels lighter, cheerful, and more comfortable, less apprehensive, and is better able and more disposed to action and motion than she had been for some time previously. In those cases, where nausea, or vomiting, was present from mechanical pressure upon the stomach, this subsidence at once relieves the patient from any further disposition to these unpleasant symptoms.

This falling of the uterus generally takes place gradually, so that several days pass before the patient is aware of it; sometimes it occurs suddenly, or in a short time, as in ten or twelve hours. As the head, covered by the cervix, must enter the brim, to a greater or less extent, during the above sinking, this is looked upon as a symptom indicative of a large, or well-formed, pelvis; being seldom observed in cases of contracted pelvis. The sinking of the uterus is usually considered to be the result of the complete effacement of the cervix uteri, with a relaxation of uterine tissue, which permits it to expand laterally. Dr. Meigs considers the womb wholly passive in the matter, it being pushed downward by the action of the diaphragm and abdominal muscles. In some females, this sinking of the uterus is followed by an unpleasant sensation of weight in the inferior part of the pelvis, with an irritable condition of the rectum and bladder, occasioning frequent and ineffectual desires to evacuate these organs, with other unpleasant symptoms, and which are owing to pressure of the presenting part upon the bladder, rectum, bloodvessels, etc. These symptoms can not be relieved by treatment, though when dysury is present, the patient may urinate freely,
r hands and knees, with the hips somewhat
e, may frequently be relieved by an injec-
few drops of laudanum have

One, two, or three weeks previous to labor, contractions of the uterus are frequently observed, to which the names of *painless uterine contractions*, or *fibrillar contractions*, have been applied. The patient experiences a squeezing sensation in the abdomen, which is unaccompanied with pain, and which occurs at intervals: during its presence, if the hand be placed upon the abdomen, the uterus will be found hard and well-defined. They occur much sooner in primiparæ than in multiparæ, and are supposed to be sometimes occasioned by the child's motions; it is believed that these painless contractions produce gradual changes in the cervix and os uteri, before actual labor commences, and may, possibly, assist in bringing about the subsidence of the uterus.

In connection with the above symptoms, the parts become somewhat relaxed and soft; though it is very doubtful whether any relaxation of the pelvic symphysis occurs, as stated by some authors. With these are frequently other symptoms, of a minor character, as cramps in the lower limbs, swelling of the labia, increase of appetite, etc.; all of which, collectively, indicate the approach of labor. But the symptom upon which we may rely as an evidence that labor is close at hand, is a mucoserulent discharge, called, by nurses and midwives, "*the show*." It is, usually, observed from twelve to twenty-four hours previous to the commencement of actual labor, and consists of a greater or less quantity of mucus, of a thin, or thick and viscid character, colorless, until labor has commenced, when it becomes mixed with more or less blood. The mucus is an exalted secretion of the follicles of the vagina, and is not to be regarded as an indication of labor, unless there be found mixed with it the gelatinous substance which had previously occupied the canal of the cervix; and the blood arises from the separation of the membranes, and rupture of the bloodvessels which pass from the cervix uteri to the fetal membranes. According to Wigand, when the mucus is thick and viscid, it is more favorable. It evidently prepares the passages for the exit of the fetus by lubricating them. It may be proper to state here, that the *show* is frequently absent, and also, it is sometimes observed for some days previous to actual labor; but these cases may be looked upon as the exceptions to the general rule; for it is usually only when the dilatation of the os uteri has commenced, with descent of the membranes, that the sanguineous show is seen — it is, therefore, a good sign of commencing labor.

Some females suffer for a week or longer previous to labor, with a restless anxiety, a wakefulness at night, pains of an irregular character about the uterus, and a peculiar nervous irritability. Others again, especially those of nervou [illegible] t, are attacked with rigors or tremors, of greater or less severity, but which are unattended with any feelings of cold. These rigors are usually indicative of rapid dilatation of the os uteri, and require no attention, unless accompanied with a sensation of cold. They frequently occur immediately after labor, and are sometimes so severe as to create some alarm in the minds of the friends of the patient, as well as of herself, and heating drinks are often injudiciously administered. Some warm diluent drink, as tea, and an extra covering over the patient will be all that are required. "If these shiverings be followed by symptoms of fever, this must be guarded against; if by severe pains in the head and abdomen, evidently not proceeding from the labor, then you may suspect that there is inflammation. If there be much flushing of the face, throbbings of the carotids, and the pulse high, there is reason to apprehend that convulsions may supervene. These accidents are rare, however; and when the rigors occur without the above accompanying symptoms, it is indicative that the labor will be active and its termination speedy."—*Blundell.*

Dilatation of the os uteri is frequently, if not almost always, attended with nausea or vomiting; these are not the *causes*, but the *effects* of the dilatation, and have no weight in sustaining an erroneous impression once entertained, that nauseants or emetics favor dilatation. The only agents proper to overcome a rigid os uteri, and forward the dilating process, are relaxants. The practitioner, who, in the first stage of labor meets with a rigid os uteri, which seems disposed to obstinately maintain its rigidity, notwithstanding the strength and frequency of the pains, will observe that an attack of spontaneous vomiting is followed by a softening, relaxation, and dilatation of the os, and is therefore a favorable symptom. As a common rule, it seldom lasts any length of time, occasions but little distress to the patient, and needs no treatment. Occasionally it becomes very painful and obstinate, requiring the aid of the physician; a few drops of Laudanum, or of tincture of Gelseminum in a draught of Soda water, will usually prove sufficient to check it; and should constipation be present, a laxative enema must be administered. It is rarely that a sinapism is required over the epigastrium; vomiting during a *protracted* labor, must not be confounded with that just referred to; it is a very unfavorable sign, and the matter ejected, will be in large quantity, dark colored, and often fetid; it will be noticed under Rupture of the Uterus.

Usually labor commences with pain, but considerable progress may be made without any pain; and occasionally the patient experiences no pain until the os has become fully dilated, and the suffering attends the expulsive effort only. True labor pains are intermittent in their character, having an interval of ease between them; at first they are short and weak, with long intervals, but gradually become stronger, more frequent, with but little or no interval between them. They may be suspended by many causes, as passions of the mind, anger, fear, surprise, grief, etc.; sudden and unexpected news, or even the entrance of the physician into the parturient room, has frequently suspended the labor for hours. The administration of stimulating liquors, which is rather common with some old nurses, is very reprehensible; I have known labor to be suspended for twelve hours, by a draught of gin-sling, advised for the purpose of *easing the pains.*

There are two kinds of pain recognized at the commencement of labor, which are termed *true* and *false pains*, and it is of importance to the patient, as well as to the reputation of the physician, to be enabled to discriminate between them. *True pains* are regularly intermittent, and are confined to the uterine region, and during their continuance, if the hand be placed on the abdomen, over the uterus, it will be found to contract and grow harder with the pain, and to become softer as the pain passes off; upon making a vaginal examination, the os uteri will be found to contract during the presence of a true pain, with a protrusion of the membranes, and to dilate during its absence.

False pains, are more frequent in first pregnancies than in subsequent ones; they are irregular or constant, and exert no influence whatever upon the uterus or os uteri, though contraction of the abdominal muscles may attend them, and which it is important not to mistake for uterine contractions. They are very apt to harass the patient during the night, and disappear through the day; and may be dependent upon rheumatism or congestion of the uterus, intestinal irritability, constipation, over-fatigue, etc., and are sometimes attended with febrile symptoms.

True pains, commence generally in the back, pass around to the front of the abdomen, as far down as the groin, recur at regular intervals, gradually increase in frequency and power, and occasion contractions of the uterus and os uteri, and protrusion of the bag of waters. *False pains*, usually commence at the fundus, have a limited extent, are irregular, and exert no influence on the uterus or os.

To remove false pains, we must endeavor to learn their cause; if they be owing to intestinal irritability, or constipation, a mild purgative, or a purgative enema will answer; if from over fatigue, rest must be enjoined, and an opiate may be administered, or, what is better, an infusion of Scullcap, or Valerian; if from rheumatism, the compound powder of Ipecacuanha and Opium, with an occasional laxative, will remove them; or tinctures of Gelseminum and Aconite. Ordinarily, an attention to the condition of the bowels, with the use of some anodyne, as tincture of Lupulin, compound tincture of Virginia Snakeroot, or the above powder of Ipecacuanha and Opium, will be all-sufficient to effect their removal. Sometimes they will be present with diarrhea; in such cases, the compound powder of Rhubarb may be given internally, with injections of the officinal clyster of Opium.

I have met with many cases, in practice, where the pains were sharp, regular, occurring at short intervals, with dilatation of the os to nearly the size of a silver half dollar, and everything indicating a speedy labor; when, after waiting a few hours, the pains ceased, and did not recur again for several days; the longest time I have observed to pass in such cases, before the re-appearance of labor, was two weeks; I do not pretend to account for these anomalies.

Labor has been variously classified by different authors, for the purpose of facilitating an acquaintance with it. The arrangement which I have adopted, is one followed by several recent writers, and will be found fully sufficient for all practical purposes; it divides labor into four classes, viz:

1. *Natural labor*, in which the fetal head presents, and where delivery is effected within twenty four hours, without the aid of any artificial power.
2. *Difficult labor*, also called *lingering*, *tedious*, and *protracted*, in which the fetal head presents, but where labor continues beyond twenty-four hours, and may require some medicinal, manual, or instrumental assistance.
3. *Preternatural labor*, in which some other part than the head presents, where there is a prolapse of the umbilical cord, or a plurality of children.
4. *Complicated labor*, in which some serious accident occurs, not connected with the presentation of the fetus.

From its commencement to its termination, *natural labor* is one continued process, marked, however, by certain peculiarities which have led to a division of it, among obstetricians, into several parts or stages. The most usual, and, probably, the most natural division, is that of Denman, who describes labor as consisting of *three stages*. The *first stage*, extending from the commencement of labor to the full dilatation of the os uteri; the *second stage*, occupying the period between the dilatation of the os, until, and including, the birth of the child; and the *third stage*, including the delivery of the placenta. The time which each of these stages occupies varies with different patients, according to circumstances.

In the FIRST STAGE OF LABOR, the os uteri will, at an early period, be found looking toward the sacrum, and will gradually approach toward the center of the brim as labor advances. The pains which are present during this stage, are of a peculiar character, and are variously described by patients, as "grinding, cutting, or sawing." They are entirely confined to the uterus, producing no sensible change in the position of the fetus, but influence the condition of the os uteri, dilating it that the head of the fetus may pass through. These are termed the *preparatory pains*, and the rapidity with which dilatation ensues, very much depends upon their force and frequency. Generally, it proceeds more rapidly during the latter half of the first stage, and is effected more slowly in primiparæ than in multiparæ.

These pains commonly commence in the back, extend to the loins, from thence to the front of the abdomen and pubes, and terminate in the neighborhood of the groins, or upper part of the thighs. Sometimes females are able, especially in the first part of this stage of labor, to conceal these pains, but usually they cause much suffering, obliging the patient to suspend for the time whatever occupation she may be engaged in, and forcing from her moans, or a short and fretful cry. The pains are not attended with any bearing down or expulsive efforts, and the practitioner should be careful to caution the patient against any of these voluntary efforts during the preparatory stage of labor, which are so often unwisely advised by ignorant nurses and midwives. As the pains proceed, they increase in severity, and last for a longer time, having shorter intervals between them, and when absent, the female manifests a certain degree of restlessness and uneasiness; the pain in the back may sometimes be relieved by pressure, but not always, and when this is the case, the matter should be left to the care of the friends, and not to the practitioner, who must be careful not to fatigue himself at an early period, lest he be unable to afford more important aid at an advanced stage, should it be required. Sometimes each pain is preceded by a slight nervous tremor or shivering, and it is not uncommon for nausea and vomiting to attend the whole of the first stage. The vomiting is beneficial in consequence of its removing crude and indigestible substances from the stomach, when they are present, and also from the relaxation of the os uteri, which is certain to accompany it. When it is very severe and annoying, I have frequently checked it by administering a dose or two of the tincture of Gelseminum. Frequently the female becomes irritable, restless, impatient, or despondent, and may say or do things which are extremely unpleasant to the physician, but which good sense will teach him to pass by in a pleasant, friendly manner, at the same time endeavoring to console and encourage his patient. By an attention to the moans or peculiar cries of the female, her expressions, and respirations, the practitioner can frequently determine the first from the second stage of labor. Respiration will be free, or if the breath be suspended, it will be for a few seconds only, without any straining or bearing down efforts, and which is the reverse of the second stage.

Generally, there is no increase of the temperature of the surface, and no perspiration, especially during the first half of this preparatory stage; and the pulse is seldom quickened until the second stage. Hohl has remarked, however, that during the first part of a pain, the pulse will be found more frequent, then remain stationary for a moment, and afterward subside into its natural action. Upon auscultation, just as a pain is coming on, there will be heard, a short, rushing sound, apparently proceeding from the liquor amnii, and which may, probably, be caused in a degree by the fetal movements, or the muscular contractions of the uterus, at the same time all the tones of the uterine pulsations become stronger and more distinct; sounds also, are heard which were not noticed before, especially those of a piping, resonant character, and which seem to vibrate through the stethoscope. As the pain reaches its maximum, these sounds become gradually dull or altogether inaudible, and return with the decline of the pain, resuming the original character during the intervals between the pains.

If we examine, during the pains, the body of the uterus will be found hard and rigid, and thrown forward, so as to place its long diameter in correspondence with the axis of the superior strait, and without which the labor would progress with much difficulty; as the pain ceases, the organ relaxes. An examination per vaginam will detect the os uteri high up, looking toward the promontory of the sacrum, and more or less dilated; most commonly, it will admit the end of the index finger, at the commencement of labor. If it be much dilated, each pain will cause a protrusion of the membranes into the vagina, which is called the "bag of waters"—and the presenting part, if it be low down, will be found to *ascend* during each contraction, but will resume its original position as the pain subsides.

The *bag of waters* is the name given to that portion of the membranes which protrudes through the os into the vagina during a pain. Its shape is generally round or elliptical, and sometimes elongated, like a sausage, and which is supposed to be owing to the nature of the presentation. During a pain it is hard, and must be carefully touched, as it frequently becomes ruptured from the slightest cause; as the pain disappears, it becomes lax and wrinkled, and recedes into the uterine cavity. It undoubtedly assists in the dilatation of the os uteri. It usually ruptures at its dependent extremity, and when the rupture occurs, that portion of the liquor amnii, situated between the fetal head and the membranes, escapes, the head descends and prevents the too rapid flow of the remainder, and delivery is soon effected. Sometimes the rupture occurs high up, the waters escape gradually, and the head being in immediate contact with the membranes, the child may be born with a *caul*, especially when the membranes in contact with its head remain unbroken. Rupture of the membranes may occur at any period of the first stage of labor, depending on their power of resistance; if it should happen at an early period, it will delay the delivery, and may cause a difficult labor. Sometimes it is not ruptured at all, but the fetus is born enveloped in the membranes, yet such cases are rare. It is important for the practitioner, as a general rule, to retain the membranes entire, if possible, until complete dilatation of the os uteri has been effected.

The *os uteri* may present several variations in its character during the first stage of labor. Thus, it may be found thick, soft, moist, dilated, or if not dilated, relaxed, and dilatable, which is a favorable condition; or it may be thick, hard, rigid—perhaps likewise hot, dry, and tender, feeling somewhat like cartilage, and which is an unfavorable condition, generally indicating a difficult labor. Toward the latter part of the first stage of labor it may be found soft, moist, cool, sensitive to the touch but not painful, and so thin that the presenting part of the fetus can be distinctly felt through its substance; this is likewise a favorable condition. Or, it may be thin, hard, rigid, perhaps tender when touched, with its edge tightly embracing the presenting part of the fetus, like a piece of cord; this is an unfavorable condition, indicating, as with the former instance of rigidity, a difficult labor. Rigidity of the os uteri will be treated of hereafter.

To return to the progress of the preparatory stage of labor; the os uteri becomes thinner and softer as the labor advances, its dilatation continues to increase, and usually, the head of the fetus passes the superior strait, occupying a considerable portion of the pelvic cavity, until complete dilatation having been effected, the os uteri is wholly effaced, and the head passes through into the vagina. Generally, if the membranes have not previously given way, they rupture at this moment, and the liquor amnii escapes with a gush. Sometimes they do not rupture but pass through the vagina and its orifice, upon the external parts, which they aid in dilating. With the full dilatation of the os uteri, which may be accomplished in from four to eight hours, the first stage of labor terminates. The duration of this stage, however, varies with different women, and frequently with the same women in different labors, and almost always occupies more time with primiparæ.

The os uteri having become fully dilated, the SECOND STAGE OF LABOR now commences, between which and the first stage, especially if the membranes have ruptured, there is usually a short interval of freedom from pain; and with some women, several hours of rest will follow without any pain.

A new order of things is now presented, the pains become much stronger and more perfect, and change from the grinding character to that of the expulsive, and it is only in this stage that the accessory powers of the diaphragm and abdominal muscles are called into action—the rectus abdominis, the external and internal obliqui, and the transversalis. The action of these muscles is rarely witnessed until the os uteri has retracted over the head, and then it commences powerful and continued. The patient fills her chest with air, and fixes it as a fulcrum for muscular exertion by closing the glottis, which prevents the escape of the air; she then grasps any object near her for support, fixing the feet firmly upon some immovable point, and forcibly bears down. Any noise or outcry is usually suspended until the termination of the pain, the breath being held until it is over; though, sometimes when the pain continues for a long time, a kind of half-breath with a short cry will be uttered once or twice during the pain, apparently for the purpose of more firmly renewing the condition necessary for powerful bearing-down efforts. The tone is not of the fretful, moaning character of the first stage, but is of a straining character, sometimes terminating in a short cry and gasping for breath, and affords a good test for the practitioner to determine the second stage from the first. Between each pain there is a perfect condition of repose, and should this stage be much prolonged, the patient will frequently doze during the intervals. The dozing is owing to fatigue, and partly to the congestion about the face and head, the result of the suppressed breathing, and requires no interference, unless it be excessive and attended with severe pain in the head, which are the premonitory signs of convulsions.

During the presence of a pain, and while the patient is so powerfully exerting herself, the heat of the skin becomes increased, also the frequency of the pulse, the eyes are bright, profuse perspiration takes place, and during the suspension of respiration, the vessels of the head and neck become congested from an arrest of the circulation, the face being florid and sometimes purple. The patient manifests much agitation, though she bears her sufferings with more patience and cheerfulness than in the first stage, and appears to have changed her fretful or despondent condition to one of courageous determination. Vomiting frequently occurs in this stage also, and is usually a favorable symptom, unless it be dark, greenish, and fetid, with fever, suspension of pains, and tenderness of abdomen, when it is a very unfavorable indication.

Upon making a vaginal examination, the head of the child will be found in the pelvic cavity, each pain forcing it toward or upon the perineum; the pressure exerted upon the head causes a wrinkling of the integuments, and overlapping of the parietal bones; and if the external parts are unyielding, the labor being protracted, a tumor, *caput succedaneum*, will form under the scalp, owing to an effusion of blood into the loose cellular membrane between the bones and integuments. The head most usually lies in an oblique or diagonal position in the pelvis, having the occiput looking toward the left acetabulum, and the forehead to the right sacro-iliac symphysis, the most dependent part being the vertex. As the head is forced onward by the pains, the soft parts of the canal through which it is passing become gradually dilated, rotation of the head ensues, the perineum becomes thin and distended, and the occiput appears between the labia. On the subsidence of the pain the head recedes, and the external parts resume their natural appearance; but on the return of another pain, the head is thrust still further down, the distension of the perineum is increased, the anus projects, and probably there may be, at this time, a discharge of the contents of the rectum, as well as of the bladder. The patient suffers most intensely, as manifested by her loud, piercing cries, or by deep, suppressed groans. As the pains continue, the distension of the perineum increases, it becomes thinner, tense, elongated, and widened, the vulva begins to unfold, and the head advances to the external labia; with the subsidence of the pains the elasticity of the perineum forces the head to recede upward, to be again thrust forward upon their renewal. Finally, all resistance is overcome, a succession of strong expelling pains, called *double pains*, because they follow each other so rapidly, that a new one commences before the previous one has terminated, causes the head to emerge from the vulva, while, at the same time, the female utters a sharp, agonizing shriek, which is followed by panting and sobbing, and, after a short period of repose, the remainder of the child is delivered. As soon as the head is born the child commences respiring and crying, or if this does not immediately, occur, it will, as soon as the mucus in the mouth is removed by means of a finger.

Dilatation of the perineum, like that of the os uteri, is accomplished in different cases, at various periods of time, sometimes requiring several hours before it is completed, especially in first labors, and as often requiring only a few pains. Its distension is so great during the passage of the head and shoulders as to endanger its laceration, which must be carefully guarded against by the practitioner.

After the delivery of the child, the female is relieved from all her suffering and anxiety, and enjoys a greater or less period of repose, until the THIRD STAGE OF LABOR commences; though, usually, she will be much excited or exhausted, with a rapid pulse, flushed countenance, and profuse perspiration. The pains are again renewed, but with less severity than before, and after one or two have been experienced, the placenta and membranes are expelled. Sometimes the placenta is delivered with the same pain that expelled the child, but usually from a few minutes to half an hour or longer, elapses before this takes place; as the placenta is not, commonly, completely detached before the birth of the child.

The delivery of the placenta is usually followed by a variable amount of blood, not to exceed a pint in normal cases; and frequently a shivering, with chattering of the teeth ensues, which, however, is not the result of cold. When the placenta is not delivered within an hour after the birth of the child, it must be managed as a *retained placenta*. If the distance between the perforation in the membrane, through which the fetal head passed, and the placenta, be ascertained after their expulsion, it will give us the exact distance between the placenta and os uteri, and thus enable us to estimate the situation of the placenta in utero.

After the secundines have been expelled, the uterus contr
gradually returns to its normal, unimpregnated condition,
be felt through the abdomen soon after the delivery,
sensation of a hard, round tumor, somewhat like a larg
few days subsequently, the exposed vessels of the
cental site, discharge a sanguineous fluid called the
to a greenish, or creamy hue, having a peculiar odo
ally disappears as the uterus resumes its non-

CHAPTER XXIV.

MANAGEMENT OF NATURAL LABOR.

It must be remembered by the practitioner, that labor is not a case of sickness, but a function natural to females, for which as complete provision is made as for any other function of the system; and all that he can do is, to carefully witness and superintend its progress, without any improper, or uncalled for interference. Indeed, the maxim of every obstetrician should be, "allow nature to pursue her own course, without any officious intermeddling." But, sometimes, as is the case with other functions, this of labor may fail from certain causes, and it is only in these failures, when the natural powers are inefficient to safely finish the labor, that the aid of the practitioner is demanded; and it is his duty to thoroughly inform himself relative to all the circumstances which may require his assistance, as well as the means of removing, or overcoming them, in the safest, gentlest, and most successful manner. In a natural labor, nothing further is required, after having satisfied one's self that the presentation and condition of the parts are normal, than to patiently await the expulsion of the head, receive it and the rest of the child, tie and separate the cord, and remove the placenta. But, as the young physician, especially, may be at a loss how to proceed in the management of a case of this kind, I shall lay down a line of conduct, an attention to which, I trust, will be found advantageous; for without a knowledge of the proper course to be pursued, a very slight interference of an improper character, may convert a simple case of labor into a protracted, or even dangerous one.

Having been engaged to attend a female in her confinement, the physician should endeavor so to arrange his business, that, at the expected time, he can readily be found by those who are dispatched to summon his presence to the parturient chamber. He should obey the summons as promptly as possible, not only that he may secure the confidence of the patient and her friends, by displaying a readiness, cheerfulness, and willingness to accord his services, but more especially that he may be in time to rectify any accidents which may occur, and to which all females are liable during parturition—as, presentation of the superior extremities, uterine hemorrhage, and (in cases where delivery takes place rapidly, with but a few pains), an encircling of the neck of the child by the umbilical cord. If he reside in a city, it is hardly necessary to take along with him any medicines or instruments, lest he be tempted to needlessly administer the one, or rashly employ the other; beside, when either are required, they can readily be obtained, and in sufficient season. Perhaps a flexible male catheter, and some compound powder of Ipecacuanha and Opium, may be the only exceptions to this rule. But with a practitioner in the country, who frequently has to attend patients many miles distant from his office, and where the delay occasioned by sending for the requisite articles may prove fatal to his patient, the case is entirely different. He should take with him, his instruments, and several vials, containing compound powder of Ipecacuanha and Opium, Laudanum, Ergot, Black Cohosh, Cotton-bark, some preparation for uterine hemorrhage, and tincture of Gelseminum, or compound tincture of Lobelia and Capsicum. The use of any of these may not, generally, be needed; but if one patient among fifty is saved, or benefited, the physician will be fully repaid for his attention to these points.

On reaching the patient's house, he should have his arrival made known to her before he enters the room, as it is frequently the case, especially in first labors, that the sudden introduction of the physician has caused a suspension of the pains for some time; beside, the female may wish to have her room arranged before the entrance of the physician, or she may be very averse to his presence, requiring some time for her friends to remove her scruples. But this cannot always be done, for with the poorer classes, who occupy but one room, he is obliged to be ushered into the patient's presence at once, and his good sense will teach him how to conduct himself in such cases. Unless from the general symptoms and appearance of the patient, he suspects the second stage of labor to be at hand, or where symptoms are present which demand his immediate attention, it will be proper to remove any embarrassment under which she may be laboring, and allow her to collect herself, by entering into conversation with her upon any subject foreign to her situation. Should the pains come on, while thus engaged, if they are of trifling importance, the practitioner may leave the room, or occupy himself in conversation with some of the friends present, and especially with the nurse, from whom he may gain information as to the condition of the bowels, bladder, and previous character of the pains. But if the pains are frequent and active, or occasion much complaining, he may then inquire of the patient, herself, in a *low tone* of voice, relative to these points; and he may also form some idea of the probable advance of the labor from the character of the pains. He should likewise interrogate as to the general health of the patient, and the character of previous labors; ascertain the present condition of the pulse, skin, and tongue, and make such other inquiries as may be necessary.

If the bowels are in a constipated condition, in the early part of the first stage of labor, a mild cathartic may be administered, as castor oil; but if the labor has advanced to nearly the commencement of the second stage, or if this stage is already present, a laxative injection should be used in preference, as being more apt to cause a speedy evacuation of the rectum. And at all times, during the labor, whenever the female desires to evacuate the bladder or rectum, the practitioner should leave the room; indeed, it is proper that he should request the patient, through the nurse, or some friend, not to retain these discharges, but to have him notified, whenever they are called for, while he is in the room, that he may retire.

As soon as it is deemed necessary to make a vaginal examination, *and which should not be delayed for too long a time*, the request must be made of the patient, through some friend or the nurse; the object of such an examination is usually understood, but where it is not, an explanation should be given, stating that it is "for the purpose of learning the condition of the parts, the manner in which the child is coming, and to know that everything is right to insure a safe delivery." Sometimes, an objection is made, especially by those in their first labors, but by a firm and gentle course, representing to the patient, that her own safety, as well as that of her child, may depend upon an early examination, the objections will generally be overcome. Should the female be pettish, or fidgety, and notwithstanding these representations, persist in her objections, declaring that she will never submit to an examination, and perhaps using harsh words to the physician, all that he can do, will be to wait patiently until the pains have subdued her caprices and antipathies, when the examination will be cheerfully granted. Generally speaking, however, there will be found no difficulty in obtaining the consent of the patient, if the request be delicately made through a third (female) person.

One other reason for requiring an early examination, is, that the accoucheur may not be detained for hours, waiting upon *false pains*. I have known several young practitioners, who, having been misled by these pains, and a delicacy as to insisting upon a vaginal examination, have been deprived of their rest for many hours, and were only made aware of their error, when the loss of confidence in their abilities determined the patient to send for another medical man, who at once explained the cause of the delay. Truly, a mortifying situation for any one to be placed in!

It is not only highly proper, but it is a positive and imperative duty of the practitioner, to conduct himself, throughout the whole course of parturition, with firmness and kindness, but especially with decorum, using no language, and manifesting no actions which might offend the delicacy or modesty of the most fastidious. It will, therefore, be proper for him to observe the persons who are in the room, previous to making an examination, prudently dismissing all but two or three, whose presence as assistants may subsequently be needed; and unmarried females should by no means be allowed to remain, as they can render but little assistance, or afford but a small share of consolation to the patient. The presence of relatives should always be preferred, and if the husband remains it is an attention which many men neglect to pay to their wives at this period, and should be rather encouraged than condemned; his presence will tend to check the obscene language of the filthy-minded, should any such be present. No pure-minded nor well-meaning practitioner would hesitate for a moment to perform all the necessary duties of his profession in the presence of a husband, which he would do in in his absence, or in the presence of females. A servant in attendance, to do the errands that may be requisite, will be found a valuable acquisition, when one can be had.

Previous to the examination, the physician must see that the nail of the finger to be introduced into the vagina is short, otherwise, it might, by coming in contact with the tense membranes, at this early period, rupture them, and occasion serious results. Indeed, a physician with long nails, and kept in a state of uncleanliness, is not a very proper nor desirable object for the parturient chamber. Filthiness of person, in any respect, implies filthiness or carelessness in practice.

There are various positions recommended for placing the female in during an examination, but the one I prefer, in the *early* part of labor, is to have her lie on the bed, upon her left side, her back being toward the physician, with the hips near to the edge of the bed, and the knees drawn up toward the abdomen, and separated a little by a pillow, or cushion, placed between them. Other positions may be advised, as to lie upon the right side, or upon the back, in which case the right or left hand may have to be used; but an accoucheur should accustom himself to examine readily, with either hand. The position having been taken, the index or middle finger is to be anointed with lard, sweet oil, pomatum, or other unctuous substance, both for the purpose of an easy introduction, and that the parts may not be readily irritated by its presence, as well as to guard against the contraction of disease, should any be present. A cloth, or napkin, should be at hand, as likewise a basin of water, soap, and towel, for the subsequent washing of the hands. In all cases, when possible, never make a vaginal examination, unless in the presence of a third person.

Having loosely thrown a sheet over the patient, for any exposure of her person is unnecessary and reprehensible, the practitioner will seat himself by the bedside in such a manner as will admit a ready introduction of the finger into the vagina, that is, with his face looking toward the head of the patient, and his side to the side of the bed next the patient. As simple as this direction may be, an error or a hesitation as to the proper mode of placing the chair, may destroy the confidence of the patient or her friends. During the presence of a pain is the period generally advised for the introduction of the finger, hence, it is frequently termed "taking a pain." The sheet is now to be raised, but without any exposure of the female, and the examining hand of the accoucheur passed quickly upward toward the vagina; the finger is to be carefully and slowly introduced along the posterior commissure, and into the vagina, carrying it along the posterior wall of this canal, until its upper extremity is reached; then, by bringing the point of the finger toward the symphysis pubis, the os uteri will be felt. The practitioner will be very careful, in this examination, not to introduce his finger into the rectum instead of the vagina, a very mortifying accident, and one which I have known to occur in the early obstetric practice of some young medical gentlemen; it will not be likely to happen, if presence of mind is retained, with a freedom from restraint and bashful diffidence. The advice to envelop the arms in a towel, or cover them with oil-silk sleeves at this early examination, is altogether unnecessary.

In this first vaginal examination, there are several conditions to be ascertained, in effecting which, the physician must proceed carefully and cautiously, and without undue haste; nor must he remove his finger, until he has *positively satisfied himself* in relation to the more important symptoms. A great fault with young practitioners, is a species of delicacy or bashfulness, which, although highly commendable, is very apt to prompt them to make a hurried and unsatisfactory examination. The knowledge to be acquired is: 1, whether pregnancy exists; 2, whether the woman be in labor, and the progress it has made; 3, which is the presenting part of the child; 4, whether the membranes are entire, or have ruptured; 5, the condition of the os uteri, vagina, perineum, and pelvic diameters.

The recommendation to ascertain the exi [illegible] f [illegible] female who declares herself pregnant, [illegible] the child very sensibly, and that she is at first sight, appear rather absurd, but when we reflect that instances have not unfrequently occurred, in which the physician, misled by the professions of the woman, who was herself deceived in regard to her condition, has remained in attendance for days and even weeks, until the discovery was made that she was not even pregnant, rendering him a mark for the jest and ridicule of all who heard of his exploits; this caution will be deemed very proper and essential. Many circumstances may occasion an enlargement of the abdomen, as flatulency, an effusion of fluid in the peritoneal cavity, tumors, etc.; and a near resemblance to labor-pains may be occasioned by spasmodic action of different muscles, leading the female to believe, not only that she is pregnant, but that labor has actually commenced. It will, therefore, be readily understood, that the accoucheur can place no reliance upon any other source than a correct, personal examination. The means by which pregnancy may be determined have already been given in Part II, page 96; but it may not be amiss to call attention to a few matters relative thereto. In many instances, the hand placed on the abdomen for the purpose of detecting the contractions of the uterus during the pains, the condition of the abdomen as to its softness or hardness, and elasticity, the extent of the swelling, and its shape, will frequently decide the question; but if there still remains any doubt, the vaginal examination will be more likely to solve it. There will be found, if pregnancy be absent, the protruding, unexpanded cervix, with a close, undeveloped os uteri, and the uterus when poised on the end of the finger, will, if not diseased, be found small, light, and very movable; but, if pregnancy be present, and labor commencing, the cervix will be found expanded, and the os uteri fully developed, and perhaps sufficiently open to allow the finger to enter, and detect the presence of the fetus. When doubt still remains, ballottement, auscultation, and the means previously recommended should be resorted to.

The female may be pregnant, but not in labor, and this is to be determined by the rules given in the previous chapter. This is a point that must, as well as the preceding, be fully solved, or else the practitioner may subject himself to much ridicule by waiting upon "false pains" instead of true ones, a circumstance which has, unfortunately, happened more than once in practice. Labor may be detected by the true pains hardening the uterine globe; by the os uteri contracting during the presence of a pain, and dilating during its absence; by the bag of w [illegible] er, tense and protrusive during the uterine co [illegible] ft and relaxed in their absence, receding

During the presence of a pain, a careful examination should be made to ascertain the effect produced by it upon the os uteri; whether this is high up in the pelvis, or low down; whether it is thin, soft, and yielding, or thick, rigid, and unyielding; and in doing this, no pressure should be made upon the membranes, lest they rupture, and a natural labor be thereby converted into a protracted one. Upon the cessation of the pain, as soon as the os uteri has relaxed, and the membranes have collapsed, *and not before,* cautiously introduce the finger within the orifice of the os uteri, to ascertain whether the head presents, and should a pain come on, while the finger is within, gradually remove it as the membranes protrude, without exerting any pressure upon them, and re-introduce it on the subsidence of the pain and collapse of the membranes. The head may readily be known by its rounded form, its peculiar hardness, and its sutures. If the hard edges of the parietal bones can be felt along the sagittal suture, there can be no difficulty in determining the presentation. The endeavor to ascertain the *position* of the head at the commencement of labor, or previous to the rupture of the membranes and completion of the first stage, is unnecessary, and exceedingly improper, and endangers the rupture of the membranes; it is sufficient to *know positively that the head presents,* and this information should always be obtained before withdrawing the finger, for it quiets any fears or anxiety on the part of the practitioner, who knows, that nature is most generally capable of overcoming or rectifying any improper positions of the head without artificial interference. "Any attempt to determine in which of the numerous positions described by some authors, the head is placed at the brim of the pelvis, would only endanger the rupture of the membranes, and disturb the regular order observed by nature in the process. Indeed, I can not discover what benefit could result from knowing during the first stage of labor, provided you can touch the vertex with the point of the finger, in which of the six or eight positions of Baudelocque and other foreign authors, the head is placed. The importance attached by some authors to a knowledge of these positions, some of which are wholly imaginary, has probably arisen from *the dangerous practice of employing the long forceps before the os uteri is fully dilated,* and before the head has passed into the cavity of the pelvis. At this early stage of the labor, *no instrument of this description can be safely used,* and if the operation of turning were required, the position of the head would have no influence upon the method we would adopt in turning. Be sure that the head presents before you state this to the nurse or patient, as they will not soon forget your mistake, if it should turn out to be a case of nates presentation."—*Lee.*

Should any other part present than the head, the practitioner has, by the examination, gained information which will enable him to give the necessary assistance at the proper time; but by neglecting to obtain this knowledge, he is highly culpable, as he not only runs the risk of exposing his patient to much unnecessary suffering, but may actually endanger her life, that of the fetus, or the lives of both. The method of determining face, nates, and other presentations, together with their treatment, will be described hereafter. I may state here, that if the index finger fails to reach the os uteri, or feel the presenting part, two fingers, the index and middle, should then be introduced, for it is imperative that the practitioner should decide the presentation at as early a period as possible. It is frequently the case, especially in females of irritable habits, that the most cautious introduction of the finger within the os uteri will occasion the uterus to contract; and in nearly all patients, the excitement produced by the finger being needlessly moved round to discover the *position* of the presenting part, will induce contractions, which may, more or less suddenly, force the membranes against the finger and rupture them, occasioning a premature discharge of the liquor amnii, an accident always to be dreaded in the early part of the first stage of labor. When the membranes are *entire*, the protruding bag of waters will be felt during the pain, and there will be no dribbling away of the liquor amnii; if they be *ruptured*, the presenting part can be more readily detected, the hairy scalp puckering up during the pain, and becoming smooth and even when it subsides; while on the contrary, the membranes are smooth and tense while the pain is on, and lax during its absence.

The finger being withdrawn from the os uteri, the dimensions of the pelvis and its conditions, should then be explored, for the purpose of determining the probable character of the labor. The point of the finger should be carried toward the promontory of the sacrum, as explained when describing the pelvic diameters, and if this be not touched, the space is ample enough for the passage of the fetus, and if deemed necessary, the other diameters may be ascertained by the rules heretofore given. The condition of the soft parts, as to whether they are hot or normally cool, dry or moist, soft and yielding, or hard and unyielding, should also be observed—the finger should [illegible] withdrawn, wiping it with the napkin, while still under [illegible] the hands may be washed.

As soon as the examination is finished, [illegible]
being naturally anxious to know whether [illegible]
terrogate the physician relative thereto.

tion for him to be placed in, for if the reply, or opinion expressed, prove incorrect, the confidence which the parties repose in him, will be at once lessened or altogether destroyed, and another medical man may be sent for; beside which, it may give rise to some apprehensions on their part, that difficulty or danger in the case exists, not recognized by the medical attendant. Consequently, a reply to such interrogations should be very guarded; the physician should never permit himself to be betrayed into the expression of a positive opinion on this subject. When the head presents, and everything appears to be in a favorable condition, he may state this, and add, that if no unforeseen circumstances occur, and the labor progresses uninterruptedly, she will, *probably*, be delivered by such a time, naming the longest possible time suggested by the examination; and if delivery is effected previous to this time, it will prove anything but a disappointment to the patient, and will occasion no doubt of the accoucheur's skill or acquaintance with his profession. The reasons for such a course are sufficiently obvious; for it frequently happens that a labor which commences rapidly and with a prospect of speedy termination, becomes protracted during its latter part; and one that has a slow and tedious beginning, may advance with rapidity during the second stage; beside, many circumstances may transpire during the progress of labor, which may convert it into one of a protracted and even dangerous character. By remembering the following points, which have been laid down by accoucheurs, a pretty accurate estimate as to the duration of labor may be formed, when not interfered with by unexpected accidents.

1. First labors are commonly more tedious than subsequent ones.
2. Labor advances more rapidly where the pelvis is of large dimensions than where it is small.
3. In proportion to the softness and yielding of the soft parts, will be the rapidity of the labor.
4. The duration of labor is always modified by the character of the pains.
5. Labor will be accomplished at an earlier period when the os uteri is dilated, or thick, soft, and dilatable, than when it is thin and firm, even though somewhat dilated.
6. A soft and slightly dilated os uteri, moist and relaxed condition of the soft parts, and regularity in the pains, are signs of a speedy delivery. When these symptoms are present, and the os uteri is dilated to a size corresponding in diameter to that of half a dollar, most accoucheurs consider it improper to leave the patient, especially if it be in the night—and which will be found a good general rule to adopt in practice.

7. Labor will be rapid where the vagina is large and yielding throughout its whole extent; but will be slow where it is small and unyielding. "If the entrance of the vagina is small, the neighboring parts cool, dry, inelastic, and as if tightly drawn over the bones; if the finger, in spite of being well oiled and carefully introduced, produces pain upon the gentlest attempt to examine, we may expect a tedious and difficult labor."

8. When the upper portion of the vagina is well dilated, and its lower portion is rigid and contracted, the labor will be rapid during its first half and protracted afterward; and *vice versa*.

9. Labor is almost always tedious in primiparæ of advanced years.

10. Notwithstanding all the above points, unexpected changes may occur which will materially alter the character of the labor, and hence the necessity of expressing an opinion, as to the duration of labor, with a cautious reserve; for "no one can know beforehand, when a labor shall be terminated," and no good practitioner ever makes prognostics. Should the examination, at any time during the first stage of labor, discover rigidity of the parts, it must be treated as described under *difficult* or *protracted* labor. If the breech, an arm, or any other unusual part presents, it should be made known to the nurse, or some friend, *but not to the patient*, and the proper means should be pursued, as hereafter laid down.

The examination being over, the condition of the patient's bowels and bladder must be attended to, using the catheter to evacuate this latter organ if required; and it must be recollected, that these are essential and necessary measures to insure a safe and speedy delivery. Now is also the time to make the proper arrangements for the delivery, as preparing the bed, and getting in readiness the ligatures, scissors, bandage, etc.; an attention to these little but very necessary matters, serves to secure the confidence of the patient and her friends, a very important desideratum in obstetric practice. The adjustment of the bed is usually attended to by the nurse, still it is requisite for the practitioner to understand the method of doing it, as he will frequently be called upon to give directions in relation thereto. A cot, hair-mattress, or straw-mattress may be used, but by no means a feather bed; and, if the patient have but the one feather bed, it must be removed or rolled to one side, that the under mattress may be used for her to lie upon. Over this a folded sheet, blanket, or any soft material, to protect the mattress or cot from the discharges, must be placed, covering that part of it which will be occupied by the patient's hips. During the second stage of labor, some recommend a piece of oil-cloth, or leather, or india-rubber cloth—these are all proper, but are not always at hand. Upon the folded blanket, or material that is employed, the sheet upon which the patient is to lie, may be placed. Care must be taken that in preparing or *guarding* the bed, as it is sometimes called, no depressions or concavities are formed, into which the pelvis might sink down; at this point it should rather be elevated a little. Thus arranged, the bed is ready for the delivery when it comes on.

A piece of narrow tape, or bobbin, or linen thread doubled, two or three times, and a few inches in length, must be secured for a ligature. I generally use two ligatures, and which, together with a pair of sharp scissors, should be placed in a convenient position for the practitioner to reach, when it becomes necessary to ligature the umbilical cord and divide it; or these may be handed to him by one of the female assistants. Long and strong pins should also be held in readiness, with which to pin the binder or bandage, after the delivery; but it will often be found that the female has a binder already made, which requires to be fastened and retained with a cord, like a corset, but these are generally troublesome and in the way, and I do not like them as well as a good stout towel, or piece of unbleached muslin, about a foot wide, and three or four feet long.

The room must be kept comfortably cool, and free from unpleasant odors, the clothing of the patient should be light and loose, and the diet, if any is required, composed of crackers, gruel, toast-water, tea, and cold water; no stimulating articles of food or drink, nor meats should be allowed, nor should any solicitations be used to induce an appetite.

Everything having been thus attended to and prepared, nothing else can be done than to wait patiently for the second stage of labor; the practitioner can do nothing to facilitate the progress of the first stage, and any interference to dilate the os uteri, or passages through which the child has to be expelled, or in any other way to hasten the labor, is a mark of ignorance, and is fraught with serious consequences. Even the too frequent repetition of the vaginal examination is improper; probably, another examination may not be required for an hour or two, but this will depend very much upon the increased strength and frequency of the pains, as well as the capaciousness of the pelvis, and the yielding character of the soft parts. It is proper to examine the hypogastrium occasionally to be certain that the bladder does not become distended with urine, and this may be done at the time of the vaginal examinations; during a protracted labor, an attention to this circumstance is very important, that the catheter may be used without delay, as soon as a necessity for it arises.

In reference to the condition of the bladder, the accoucheur should always personally satisfy himself, for it often happens that he will be told the urine passes freely, when, in fact, there is only a mere dribbling of fluid upon the recurrence of each uterine contraction, and which may be the liquor amnii, or a portion of urine forced out of the bladder in consequence of its contraction by the abdominal muscles; this latter circumstance is an indication that the bladder contains a large amount of fluid, which requires an artificial evacuation. In introducing the catheter, the index finger of the left hand is to be passed between the labia majora, and carried toward the vestibulum, at the lower part of which, just within the lower angle of the pubic symphysis, the meatus urinarius may be detected by a slight pressure of the finger upon this part; the point of the catheter should then be passed along the inner surface of the finger, until it reaches the urethral orifice, when a slight movement will cause it to enter. It should be passed upward without force, until about three-fourths of it has entered, being careful not to allow it to slip entirely into the bladder; some small vessel must be in readiness to receive the urine as it passes. When the pelvis is occupied by the head, a flat catheter will be preferable to a round one, as it does not take up so much room in the antero-posterior diameter. Sometimes the introduction of the instrument into the bladder will be facilitated by gently raising the head of the child, during the absence of uterine contraction.

Some time may elapse before the commencement of the second stage of labor, and a few suggestions relative to the mode of employing the time, may be of service, especially to the young accoucheur. If the labor has just commenced, and everything is found right on examination, there will be no necessity for tarrying at the house; the practitioner may return home, or visit other patients, being careful not to allow his absence to exceed one hour, as it may then become necessary to institute another vaginal exploration. Much, however, will depend upon circumstances; if it be a first labor, it will not, probably, progress very rapidly; if previous labors have been rapid, too long an absence from the patient is not advisable, and more especially when the os uteri is dilated to nearly the size of half a dollar, or is very soft and dilatable; for it must be remembered, that although it may have required several hours to obtain the above degree of dilatation, the remainder of the process may be effected in a very short time, and labor be completed by only a few more pains. Should the physician conclude to remain with the patient during the first stage of labor, and which is the course usually pursued when the v [illegible] ate at night, it is a proper that he should continue all the time in the parturient chamber, as it may prevent his patient from attending to the fecal and urinary discharges, the calls to one or both of which are apt to be rather frequent. He should retire to some other room, generally, if possible, so situated that he can hear the cries of the female, and thus be able to determine the progress of the labor, as well as the necessity for another examination. Or, if this can not be done, the room not being favorably situated for the purpose, he will request the nurse to inform him, from time to time, of the advance of the pains, their frequency and strength. While thus absented in another room, he may employ himself in reading, in conversation, etc., but should never permit himself to become so far interested in whatever employment he adopts, as, for a moment, to forget his patient. Or, if there is a probability that the labor may not require his immediate attention for a few hours, he may lie down on a sofa or bed, and enjoy a short sleep, until the nurse awakens him, at such time as he may have requested. If there is but one room occupied by the family, as is frequently the case with the poorer classes, it will be proper for him to leave it occasionally to take a peep at the stars, or a glance at the weather, or to inhale a little fresh air, for the purpose of relieving a little dullness of feeling, etc., remarking as he goes out, that he will return in ten or twelve minutes; thus giving the female an opportunity to attend to her evacuations. These little attentions, and especially if performed with a degree of delicacy, will always produce a favorable impression, which may subsequently prove advantageous to the physician.

While in the room with the patient, it is always proper to speak encouragingly to her, and endeavor to cheer her up, occasionally assuring her when such is really the case, that everything is going right. But, above all things, avoid that very reprehensible and demoralizing practice, which is too common among some persons, of indulging in filthy and obscene conversation; some individuals, and among them I regret to say are found females, seem to select this as the best time for the delivery of all the obscenity with which their minds are filled, and vie with each other as to who shall bear off the palm in such disgusting loquaciousness. This kind of chat has a depressing and injurious influence upon the patient, beside polluting the minds of all present; and I have no doubt, but that the first approach toward a departure from virtue, has, with many females, commenced in the parturient room, where these coarse and indelicate conversations were permitted. No gentleman, and certainly no lady, would be guilty of such low and undignified behavior. It is the duty of the physician, at all times, and under all circumstances, not only to preserve and protect the health of his patient, but likewise to preserve and protect the purity of her mind, and any one who pursues a different course, should not be recognized as a professional brother, nor as a man worthy the confidence of community.

It is not necessary, during the first stage of labor, that the female should retain the recumbent position, she may sit up, walk about, lie down, and change her position, according to her inclination; nor should any bearing down efforts be permitted during this stage, as they exhaust the patient's strength, without effecting the least benefit whatever, and may also cause a premature rupture of the membranes, and thus convert the labor into a difficult one. It is only when the os uteri is fully dilated, and the membranes have ruptured, that she must assume the recumbent position, or make use of any voluntary efforts at bearing down.

After the full dilatation of the os uteri, until the birth of the child, the female should be required to remain in the recumbent position, lest, while moving about, the child should suddenly be expelled upon the floor, and the uterus, following the cord and placenta, become inverted. If, at the complete dilatation of the os uteri, the membranes have not ruptured, *the head presenting*, and the soft parts being yielding, the accoucheur should rupture them; but not under other circumstances, except those referred to hereafter. Sometimes, the head emerges from the vulva simultaneously with the rupture of the membranes, but this most commonly occurs in cases where the membranes are unusually tough, and have been allowed to remain entire until the head has cleared the os uteri and advanced considerably into the pelvic cavity.

During the *second stage of labor*, many practitioners pass a towel around each fore-arm, without removing the coat, as a protection against the discharges. The towel is doubled so as to form a triangle, the base, or folded edge of which, is passed rather tightly around the wrist, but not so as to interfere with its free motion, the rest being folded with one end over the other, around the arm, and then pinned, and which is usually done by some female present. Others, again, have oil-silk sleeves for the purpose, which they draw on over the coat sleeves. Some, merely remove the coat, and roll up the shirt sleeves, thus having a free, unimpeded use of the hand and arms, especially in cases where manual assistance is required. This latter plan is the one which I prefer; but the accoucheur may please himself in these respects.

After the rupture of the membranes, the practitioner should make no delay in ascertaining the *position* of the presentation; and an early examination, at this time, is often of much importance, as any mal-position may be more readily rectified than at a later period. The situation of the head at the time of the rupture, varies; most commonly it will be found just within the brim, sometimes midway in the pelvic cavity, or at the perineum, etc. The position of the head may be determined by the rules named in Chapter XXVI. During this stage of labor, the patient should not be left by her medical attendant, who will find it necessary to repeat his examinations every four, six, or eight pains, according to their frequency and strength, and the rapidity with which the head advances; and after these examinations, it is not necessary to wash the hands each time, but merely to dry them on a napkin, secured for the purpose. Should the patient suffer from cramps of the lower extremities, they may be removed by frictions with the hand over the part affected, or ligatures around it, or warm applications; pain in the sacrum, occasioned by pressure of the presenting part upon the anterior sacral nerves, may be relieved by firm, counter-pressure against the posterior face of the sacrum, during a pain, and which should be made by the nurse, or some female present; the practitioner should avoid any kind of fatiguing exercise, or manipulation, unless when imperatively required. If, however, the pain should be very severe, and no relief be afforded by the counter-pressure, and the efficiency of the pains be, at the same time, diminished, it may become necessary to relieve the agony of the patient, by hastening the delivery with the forceps. I have heard of a Professor of Obstetrics, who informed his class, that he had relieved several instances of this kind, by placing a folded handkerchief between the head and the nerves. But it must be remembered, that this would still further diminish the diameter of the pelvic cavity, and be very apt to produce irritation, dryness, and probable inflammation of the parts; perhaps the Professor may have dreamed of these several cases, and forgotten that they were but dreams.

The position which I prefer for the *delivery*, is on the back, having the knees flexed toward the abdomen, and the feet resting against some support, as the footboard of the bed; and a sheet or towel, fastened to the bedpost, may be held by the patient, upon which she may pull during the presence of the pain, or the hand of an attendant may be used. In this stage, the auxiliary aid of the diaphragm and abdominal muscles are useful, and the patient may be advised to make bearing down efforts, when the pain is on. Her dress should be so far drawn up underneath her, as to prevent it from being soiled by the discharges. And until the period when the head presses upon the perineum, it is not necessary for her to remain in one position all the time, though she must not be allowed to get out of the bed. It is during this stage, that many practitioners apply an obstetrical supporter with advantage; the description, in the note below, is by Prof. C. H. Cleaveland, who refers to Finch & Blaisdell's obstetrical supporter.°

Various other positions for delivery, are recommended by writers, and assumed by females; as sitting, kneeling, leaning over a chair, and lying on the left side. Females, generally, will assume the position recommended by the physician, but where they obstinately prefer a certain position, and it is immaterial, as far as the delivery is concerned, it is better to allow them their own way. Lying upon the left side, with the knees flexed, and a pillow placed between them, is the position most generally recommended in this country and England; but I do not think that the delivery proceeds with so much ease and rapidity as when the female is placed upon the back. Some writers maintain, that the action of the uterus is frequently interfered with, and the progress of labor impeded, when the female lies on her left side, in consequence of an obliquity of the uterus, caused by this position; also, that the too close condition of the limbs, produced thereby, retards the labor, and to

---

°"The supporter consists, essentially, of a pad, to be placed upon the loins, and upper portion of the sacrum, or where the patient desires pressure, when in labor. To this, are attached straps that buckle in front of the shoulders, and prevent its falling, or slipping too low down upon the hips. At each end of this back pad, are rings, through which pass straps terminating in a loop through which the feet pass, and are supported as in a stirrup. At about as low as the knee, in these straps, are rings through which other straps are buckled, for the hands to grasp to give support to them.

"The part of the apparatus above described, when in use, acts as follows.—When the pains of labor are felt, the patient is inclined to push with her feet, and draw with her hands; and let her position be either the recumbent upon her side, or her back, or the sitting, either upon a chair, or the edge of a bed, the pressure upon the loop of the strap with her feet, brings the back pad firmly against the place where her back requires support, and, without the aid of an assistant, the back, the feet, and the hands, are at once supported as long as the pain continues. As that passes away, the muscles of the patient are relaxed, and she is at once relieved of the pressure, until the return of another pain.

"The more prominent advantages of this part of the apparatus are, entire and certain support for the hands, feet and back, in whatever position the patient may be, when the pains come on, and an entire freedom from pressure when the pain ceases; and the relief it gives to the attendant women, who are not called upon for the usual severe physical efforts they are required to make when the supporter is not used. Another great advantage is derived from its use in hot weather, as then the patient is not surrounded with attendants whose breath and presence usually add greatly to her heat and discomfort. *With* the supporter, she needs but *one* person, beside the physician, and she only to fan her, give her drinks etc.; while *without* it, she would perhaps give employ to two or three, who must be constantly near her.

"In addition to the above, there is an *abdominal pad*, which is so arranged, that it can be applied to the lower part of the abdomen, where the child is too low to elevate it to its proper position, or directly in front, or to the upper part of the abdominal protuberance if a downward pressure is desired. This can be drawn as firmly against the overcome which the advocates of this position, advise a pillow to be placed between them, which causes much unnecessary heat. When lying upon the back, the limbs can be kept apart with ease, the axis of the uterus is brought into a favorable direction for an easy delivery, and the patient, being in a position requiring no muscular exertion to maintain, can freely and more powerfully employ the abdominal muscles.

When the head has reached the perineum, the practitioner will take his seat by the bedside, in the position heretofore named, and as the part begins to distend, he should keep his finger gently upon the head, during each pain, so as to ascertain the proper period for supporting the perineum, in order to protect it from becoming lacerated, and the advance of the head must be determined, not by its condition at the pubic arch, but at the perineum. As soon as the perineum is fully distended and protruding, and the head about emerging, and not before, a folded cloth, or napkin, is to be placed over it, extending from its anterior edge to the coccyx, and which must be supported by either hand, as the case may require, but commonly the right. The pressure made must be

---

abdomen as may be desired, and either fastened thus, or attached to the straps which support the feet, so that additional pressure will be given by the feet at each pain. With all these advantages, the woman is *not* confined so but she has the perfect use of her limbs, and can lie down, sit, stand or walk, as well while wearing the supporter, as she otherwise could do.

"During the present week, I was called to attend a young woman in labor with her second child. She is a large, muscular woman, and capable of great physical effort. Some months since, she felt a pain in the lower part of the abdomen, just above the symphysis pubis, and the pain and tenderness continued to increase up to the day of confinement. There was nothing unusual about the labor, at first, except the pains were quite hard, and the distress was mostly felt at the old seat of tenderness. As the head of the child descended to the lower pelvic strait, the membranes gave way, and the amniotic fluid was discharged, and immediately the patient complained of severe *tearing* pains in front. After two or three additional pains, and after the discharge of all the water, she said the distress in that region was beyond endurance. On passing my hand over the abdomen externally, I found that part, where the pain had been felt, very tender, and protruding a globular tumor of the size of a two-quart measure. Fearing a rupture of the uterus, I applied the abdominal pad of the supporter firmly over the protrusion, and proceeded at once to extract the child with the forceps. From appearances at that time, and subsequently, there was no doubt in the minds of those present, or in the mind of a physician who examined the case a few hours afterward, that the only thing which could be done to prevent a rupture of the uterus, was the timely application of the abdominal pad, and the extraction of the fetus. From the time when the protrusion occurred, until the woman was delivered, could not have been more than three minutes; but during that short space, she says, she suffered more from the peculiar pain she felt in front, than from all the pains of her former and present labors combined.

"In ordinary easy labors, it may not be desirable, in all cases, to apply the supporter; but in hot weather, in all protracted, or severe cases, and especially in those cases where the back or the abdomen require unusual support, I think this apparatus will give entire satisfaction, to all who make a trial of it."—*Boston Med. and Surg. Journal.*

moderate, it must not interfere with the advance of the head, the part requiring firmer support toward the coccyx than at its anterior edge; and instead of making efforts to retract the skin over the head, as it passes through the orifice, it should be rather carried forward, which will diminish the risk of laceration, by facilitating the movement of extension of the fetal head. This pressure should only be made when the pain is present, and it would be much better to leave the part entirely untouched, than to make improper pressure, which has frequently, of itself, occasioned the very difficulty it was intended to obviate.

My experience in this matter, leads me to believe, that laceration of the perineum would be a rare accident, were the rule to support it during the latter part of the second stage, entirely dispensed with in obstetrical practice. Some writers recommend the support of the perineum, not only during the passage of the head, but likewise of that of the shoulders, from a belief that the perineum is frequently lacerated as the bis-acromial diameter is emerging; in some instances, an attention to this point may prove serviceable, but I do not regard it necessary as a general rule.

While the head is at the perineum, pressing upon the lower part of the rectum, a great disposition to evacuate the bowels will be produced, and the female will desire to rise and attend to the call; but it must by no means be granted, as a violent pain might come on, and the child be delivered, and perhaps, destroyed, before the physician could bestow the necessary attention. Beside, these desires generally disappear with the delivery of the head. I have twice witnessed the delivery of the child, and its reception into the chamber-utensil, where the physicians had permitted the females to attempt an evacuation of the rectum, at this stage of the labor. Again: should the bowels not have been opened, early in the labor, and the probability is, that a fecal discharge may happen, the patient must not be permitted to rise from the bed, but must perform the evacuation on some old, useless cloths, to be placed under her for such purpose, and which are then to be immediately removed.

It is sometimes the case, that the pains cease, or diminish in strength, toward the close of the second stage, but they may be renewed by making firm pressure with the left hand, upon the uterus, each time of its contracting, or, by pressing firmly on the end of the sacrum.

As the head passes through the vaginal orifice, it should be received into the right hand, holding it loosely, so as to admit of the motion of *restitution*, and, at the same time, a finger should be passed around the neck of the child to ascertain whether the umbilical cord is coiled around it, and which commonly occurs when the cord is of more than ordinary length. If the neck be embraced by one or more turns of the cord, it must be liberated by loosening it, and passing it over the head; or else the following results may ensue, especially if the cord be short: the compression may arrest the circulation in the bloodvessels of the neck, and prevent the access of air into the lungs by closure of the trachea, thus destroying the child; or, the expulsion of the child by a strong pain, might cause inversion of the womb, or serious hemorrhage by tearing the placenta from its uterine attachment. If the cord cannot be easily passed over the head, it must be loosened as much as possible, so as to prevent strangulation of the vessels of the neck; for it must be remembered, that ordinarily, even with two or three coils around the neck, the cord will be sufficiently long for delivery to take place, without any evil consequences to the mother. Sometimes, the cord is so placed around the neck, that it has to be divided before the body can be born, a ligature being applied as soon as possible; but this is done only in those extremely rare cases, where the free portion of the cord is rendered so short as to endanger inversion, should the child be delivered. It is frequently the case, that an evacuation of the rectum occurs with the expulsion of the head, but the compress at the perineum serves to protect the hand of the accoucheur from being soiled by it.

As soon as the head is born, the child commonly commences crying lustily; frequently, however, the presence of mucus interferes with its breathing, and the practitioner should pass a finger into its mouth for the purpose of removing any mucus or other obstruction that may exist there.

No attempt, whatever, should be made at removing the body, unless much delay occurs in the natural process, or the life of the child is in danger. After the birth of the head a short interval generally follows, but if this is prolonged, serious consequences may result; under such circumstances, a finger may be inserted into the axilla nearest the perineum, and traction made in the direction of the axis of the inferior strait, while, at the same time, pressure is to be made by the other hand, or by an assistant, on the abdomen over the uterus. One shoulder disengaged, the other soon follows, and the child is born without any further trouble. But, when the body follows the head without requiring any assistance to expel it, the right hand must be passed along with the head, supporting it as it moves, and the body must be supported by the left hand; and as soon as the child is expelled, it should be laid upon its right side, with its back to the mother's genitals, to prevent it from receiving any of the copious discharge which follows, into its mouth;

or, it may be placed with its abdomen toward the mother, so that the mouth is protected from the discharges. And in moving the child, care must be taken not to make sudden or powerful traction on the cord, as the uterus may become thereby inverted, or a portion of the placenta by being roughly detached, may occasion alarming hemorrhage.

The expulsion of the child terminates the second stage of labor; and it must be ever borne in mind by the physician, that in a case of natural delivery, there is nothing for him to do in these two stages, but witness the progress of the labor, console and encourage his patient, and receive the child after its expulsion. Any interference, in either the first or second stages, when everything is proceeding favorably, further than I have just described, is exceedingly improper and criminal.

I am aware that some writers advise, and many practitioners adopt the plan of administering ergot to all parturient women, in the second stage of labor, for the purpose as they say, of promoting the easy expulsion of the placenta, and subsequent uterine contraction, thereby lessening the risk of hemorrhage; but, more for the purpose, as I strongly fear, that they may the sooner visit another patient and procure another fee, or, perhaps, from want of sympathy and patience. I consider this a very unscientific and censurable practice, and have witnessed many accidents resulting from it; indeed, when the action of the ergot has subsided, the reaction which must ensue, would be very apt to produce a condition of the uterine tissue favorable to hemorrhage from that organ. From a practice and observation of twenty years, I am thoroughly convinced, that the administration of ergot to cause contractions of the uterus, *whether indicated or not*, occasions and develops a greater proportion of diseases of the organ, than is generally suspected by the profession.

A natural labor may be accomplished in two hours, or it may continue for twenty-four or even longer, without any danger. The danger is never to be estimated by the time which the process occupies, nor by the severity of the pains, but by the symptoms which are present. So long as the parts are in a proper condition, position and presentation right, and the pulse unaffected, there is no necessity for haste, alarm, or officious intermeddling, no matter how long the labor continues; the practitioner should appear cheerful, resolute, and confident, at once check any complaints or whisperings among the female attendants, and use all means to sustain the patient's spirits, and preserve her from despondency, which may cause a suspension of uterine contraction, convert the labor into a difficult one. But, if the parts become h dry, with more or less ter [illegible] on being touched, and th accelerated, it is then necessary to interfere, calmly, deliberately, without violence or rudeness, and employ the proper means to overcome the difficulty.

Sometimes, after the delivery of the child, the female will be attacked with violent pains, and forcible straining, or bearing-down efforts; as these may be owing to a disposition to inversion of the uterus, the practitioner should endeavor to ascertain their cause, and remove it if possible, at the same time urging upon the female the importance of resisting these efforts as much as possible, lest inversion should be produced by them.

The *third stage of labor* commences after the birth of the child, and may be considered the most important period of the process, for by far the greater part of the accidents of labor occur at this time, either from improper intermeddling, or from an ignorance of the correct mode of proceeding. After having observed that the child is living, as made known by its crying, it must be separated from its uterine attachment; and this must be effected without any exposure of the mother—a point which I desire the reader especially to impress upon his mind—as many practitioners, at this stage, are very apt to needlessly expose their patients.

As soon as the pulsation of the cord of the living child ceases toward its placental extremity, say at a distance of five or six inches beyond its abdomen, or, as far as can be reached by the hand without introducing it into the vagina, the accoucheur will proceed to cut the cord. The child must be withdrawn from beneath the bedclothes, if the length of the cord will permit; or if too short, the operation must be performed under the bedclothes, raising them to effect it, taking especial care, however, to previously place over the parts of the patient a well-aired cloth or towel, that they be perfectly covered and concealed.

The ligatures, which had been prepared in the early part of the labor, are now to be used; they should not be so thin as to risk cutting through the membranes and vessels of the cord, nor so thick as to be incapable of making firm compression, sufficient to prevent bleeding after the separation. The cord is to be tied tightly with one of these, at a distance of an inch or an inch and a half from the umbilicus, care being had not to include any portion of protruding intestine, which is occasionally met with; as in these cases, the incautious ligaturing of the intestinal protrusion would give rise to the most disastrous consequences. The second ligature is to be applied two or three inches beyond the first, and the division must be made between the two with the scissors, being careful not to excise, at the same time, a finger, or a portion of the child's penis, if it be a male. In this operation the practitioner should see what he is doing. I am well aware that many authors advise the application of but one ligature, and consider the employment of the second superfluous, but I prefer two in all cases, not from an erroneous impression held by some, that the female may lose blood through the unprotected, open vessels of the cord, but for the following reasons: In the first place, I am well convinced, that, in many instances, by thus retaining the blood within the cord and placenta, it acts as a provocative to uterine contraction and insures a speedy detachment and expulsion of the placenta; secondly, it is much more cleanly, and dispenses with the pressure of the thumb and finger to prevent the blood from spurting over the bedclothes, or even on the clothing of the practitioner; thirdly, it is safe in case of twins, with anastomosed circulation in the placenta, should the practitioner, as is frequently the case, have neglected to place his hand on the abdomen to ascertain the size of the uterine tumor, and the probability of the presence of a second child; and fourthly, should it be judged advisable not to have the second ligature, it can very readily be removed, or another separation of the cord be made.

It is sometimes the case that the child is born in a state of defective vitality, asphyxia, or apoplexy. If the pulsation in the cord continues, and the child does not breathe, some cold brandy sprinkled on the region of the diaphragm, and perhaps a few light frictions made rapidly over the body and extremities with a piece of warm flannel, will be all the means required for its resuscitation; previous to which, however, the finger must be carefully passed into the mouth, as far down as possible, in order to remove any mucus which may be present, obstructing the respiration.

Where these means do not suffice, it may become necessary to produce artificial respiration; a flexible catheter, or laryngeal tube must be cautiously and correctly introduced into the larynx, after which the angles of the mouth must be closed to prevent the escape of air; the practitioner will then apply his mouth to the free end of the tube and slowly and gently inflate the lungs, simulating breathing by making gradual pressure on the chest to expel the air, which he continues to introduce for some time; with these attempts he may also sprinkle water or brandy over the face and chest, apply warm flannel to the surface, and administer an injection. Some children are not resuscitated until after a persevering trial of an hour or two. The first symptom of returning life is a short sob, which increases in frequency until respiration is established, after which, the child should be kept at a sufficiently elevated temperature, and in a state of rest and quiet. Upon the first return of vitality, the warm bath used for a very short time, frequently facilitates the restoration.

This condition of the child may arise from a premature detachment of the placenta, from uterine hemorrhage, or from defective nourishment, and is generally accompanied with little or no pulsation in the cord, and but slight action of the heart, and as nothing is to be gained by maintaining the connection of the fetus with the uterus, it will be proper to cut the cord; but in all instances where the pulsation of the cord is distinct, though feeble, I deem it inadvisable to make the division, until respiration has been fully established; and in those cases where the placenta has been expelled, it should be wrapped in warm, damp cloths, and no separation made until all pulsation in the cord ceases.

Apoplexy may be known by the lividity of the face, blueness of the surface, labored, or obscure action of the heart, and feeble, or imperceptible pulsation in the cord; while, in the instances above referred to, the color of the surface is natural, or pale. Apoplexy may result from prolonged labor, compression of the head by a narrow pelvis, or from a delay in the expulsion of the body after the delivery of the head, etc., and it must be treated by removing the cerebral and pulmonary engorgement. In these cases it is recommended to cut the cord without ligaturing it, and allow the escape of from half an ounce to an ounce of blood, at the same time sprinkling tepid water over the head, face, and chest. As in the previous instances, the mouth and fauces should be freed from mucus, and artificial respiration may be attempted. If recovery ensues, the surface becomes paler, or slightly rosy, the pulse more frequent and stronger, and efforts at inspiration are made; and when these symptoms appear, the cord may be tied. In all these instances, the practitioner should not become discouraged at too early a period, and therefrom slacken his efforts, as almost hopeless cases have been resuscitated after long, but patient and continued treatment. When the pulsations in the heart and cord have ceased for several minutes, attempts at restoration will be useless.

The cord having been cut, the child is to be passed to the nurse, who is generally ready to receive it in a small blanket, prepared for the purpose; but as its body is very slippery with the waters, blood, or vernix caseosa, there may be danger of dropping it, if it be not taken hold of properly. To avoid any such mortifying accident, the practitioner will seize it by the ankles, with his left hand, placing a finger between the two; and will have the back of its neck to rest in the arch formed by the thumb and index finger of his right hand, resting the upper portion of its back upon the palm of this hand, and placing the points of the three remaining fingers under its right axilla; thus held, it cannot fall. Some advise the left hand to be placed at the breech, with one finger between the legs, the left thigh grasped by the thumb, and the right thigh and nates resting on the remaining fingers and palms, at the same time making gentle pressure of the hands toward each other, for the purpose of more securely holding the child. Either of these methods may be safely adopted.

The next thing is to ascertain, if it has not been previously done, whether there is another child in the uterus; this may be known by placing the hand on the abdomen, when the fundus uteri will be felt still in the epigastric region; and an examination per vaginam will detect the bag of membranes, and the presenting part. If, however, the uterus be found small and hard like a solid ball, when grasped through the abdomen; or small, but soft and doughy; or small, but becoming hard and soft alternately, no second child is present, and the placenta has probably passed, either partly or wholly into the vagina. If it be hard and nearly the size of the adult head, there is no child, but a contraction of the uterus upon the mass inclosed within its cavity; and if it be thus large, but soft and doughy, contraction of the organ has not yet taken place for the purpose of expelling the placenta. The treatment of twin cases will be considered hereafter. Having ascertained that no twin-child is present, the practitioner will attend to the *delivery of the placenta;* occasionally, the same pain which expelled the child likewise ejects the placenta. But, usually, from five to thirty minutes elapse from the birth of the infant, before the uterine contractions are renewed for the purpose of removing the secundines. The left hand should be placed on the hypogastrium, and if the uterus be found hard and well defined, and the patient complains of some pain, but not so severe as before, the organ is contracting and expelling its contents, and the right hand should be ready to receive them as they emerge. If, however, the uterus be found large, soft, and yielding, or, if it be not felt at all, it may be caused to contract by gentle friction and pressure on it, through the abdominal parietes, and as soon as it contracts, the woman should bear down, and slight traction be made upon the cord with the right hand, in the direction of the axis of the superior strait, which will carry the cord backward to the os coccyx, and as soon as the placenta moves, the motion will be recognized by the hand. In the meantime, the left hand should continue upon the hypogastrium, both for the purpose of exciting the contractions, as well as to admonish a cessation of the traction, whenever the uterus grows soft, or manifests a tendency at some portions of the fundus, to become depressed and follow the direction of the traction, and thus, probably, be partially or completely inverted. Whether the placenta be in the uterus or vagina, if the soft condition of the uterus continues, notwithstanding the means used, the labor may be complicated with hemorrhage, to treat which, according to the rules hereafter given, the physician must be thoroughly prepared.

When the placenta has emerged from the vulva, it should be twisted or turned around several times, for the purpose of forming a cord or string of the membranes, that, thereby, no portion of them be left attached to the uterine surface, thus effecting a clean and perfect delivery. If a portion of the membranes be left within the uterine cavity, they may give rise to unpleasant symptoms, as putrefaction, offensive discharges, etc.; or should portions of them pass away in a few hours afterward, they may occasion alarm to the patient, or lead her to think that her medical attendant is not perfect in this department of his profession.

It is always proper for the practitioner to ascertain as early as possible after the birth of the child, whether the placenta is detached, that he may remove it; but, unless there be flooding, or some other circumstance demanding the immediate delivery of it, it is inadvisable for him to make any more active efforts than above named, to bring about its expulsion when not effected naturally, for at least one hour subsequent to the child's egress; then he will treat it as a retained placenta. And in all cases of natural labor, it must be thoroughly impressed upon the mind, that no force or haste is required in removing the placenta and membranes, but they should be drawn forth slowly and carefully, to prevent any tearing of the membranes, or other unpleasant accidents arising from too hasty a removal of them from the uterine or vaginal cavity.

The secundines being completely removed, the practitioner will request the nurse to bring a basin or some other vessel, in which to place them, covering them with a cloth, "for the sake of decency." Then he will ascertain, by placing a hand on the abdomen, whether the uterus is small and contracted, or large and soft, which latter condition indicates a tendency to internal hemorrhage, and the pulse and countenance of the patient should be at once examined, as described hereafter. The delivery of the placenta closes the third stage of labor; a stage of the process which requires much judgment and presence of mind, for the slightest mistake or misconduct might lead to the most serious consequences; and with all difficulties which may occur at this stage, as well as their treatment, the physician should be thoroughly and familiarly conversant.

As soon as possible after the birth of the placenta, and especially in cases where it has been found necessary to extract it artificially, the practitioner should ascertain that there is no inversion of the uterus, and should likewise examine the placenta and membranes to see that the whole of them have passed away, and that no portion of them has been left within the uterine cavity, subjecting the patient to severe pains, nausea, vomiting, and hemorrhage. In this examination both surfaces of the placenta should be inspected.

Unless there are certain circumstances, or symptoms present, which will be referred to hereafter, it is not material that the bandage or binder should be applied until after the expulsion of the placenta. It should be passed under the patient's back, carefully, being made to embrace the hips and the whole abdomen, and without requiring any efforts on her part to assist in its application; it should be pinned or fastened from below upward, having that portion around the hips and lower part of the abdomen, more tightly applied than the rest, or sufficiently tight to occasion a very slight degree of uneasiness when first placed on. If, however, there should be considerable of the discharges present, so as to endanger wetting the binder, these must first be removed, or covered over with dry cloths. Many writers consider the bandage of no practical importance, but I am well convinced of its utility. When firmly applied, and pressing equally upon the anterior surface of the abdomen, it promotes the regular contraction of the uterus, and gives support to the viscera, thereby diminishing the risk of hemorrhage, and syncope; it likewise assists a return to the natural condition of the abdominal parietes, preventing that lax state of the integuments which causes a "pendulous belly." When, in dropsy of the abdomen, the sudden removal of the pressure is effected by tapping, unless a bandage is applied and tightened as the water passes off, syncope and nausea are very apt to ensue; the removal of the uterine contents in labor, whereby a removal of pressure is speedily accomplished, is a somewhat analogous case, requiring similar measures for relief. The binder may be worn for a few days succeeding delivery, not certainly to exceed eight or nine; and its longer employment, as advised by some physicians, for two or three weeks, strikes me as being a useless measure. A bandage applied too tightly, and especially when worn longer than the first few days, would, in my estimation, very much endanger some displacement of the uterus. Generally, the binder is applied by the nurse or some female friend, but the physician should understand how to apply it himself, and should always ascertain that it is properly placed and tightened before leaving the patient. He will, frequently, be requested to place the bandage on his patient, but, as a general rule, I consider it a task entirely out of his province, and one which should be invariably performed by a female. To be of the greatest service, the bandage should be applied next the skin, and I can not conceive of any office more offensive to female purity and modesty, and more repugnant to the sensitiveness of a man of honor and refinement, than that of bandaging a naked and exposed parturient woman. True, physicians and females have often to be placed in even more delicate and exposed situations than this, but then it is only in those cases in which health and life render it imperatively necessary, and in which, from the dangers to the patient, modesty becomes a vice. She must be, truly, an ignorant nurse, who is incapable of correctly bandaging a parturient female. Although I consider the application of the bandage, the duty of the nurse, yet it is the physician's duty to ascertain, after it has been done and the female covered, whether it is applied properly. And in those instances where he is desired to place the bandage, himself, and no excuses will be received, he may adjust it over the body-garment of the patient, and thus obviate the necessity for exposure. After the application of the binder, some warm, dry cloths should be loosely applied to the vulva, for the purpose of absorbing the discharges, and preventing them from soiling the dry clothes of the patient. These cloths should be examined from time to time, while in the house, for the purpose of ascertaining the degree of hemorrhage; and for the same purpose, the hand may be placed upon the abdomen occasionally, to learn if the uterus continues contracted; the pulse likewise ought to be felt several times, and inquiries be made as to whether the patient experiences any sensations of faintness.

The "putting to bed," as it is termed, in which the patient is moved into her regular bed, should take place as soon as circumstances will permit; in ordinary labors it may be accomplished in an hour after the delivery, or, following the washing and dressing of the child; but if the labor has been tedious, or very painful, it must be delayed according to the strength and circumstances of the patient. In the process of "putting to bed" the practitioner must be very careful that the patient uses no exertions on her part for the purpose of giving assistance, and that she be not removed from the horizontal position, lest hemorrhage be thereby induced. The husband and two females may carefully raise and remove her, or she may be carried in a strong sheet, held by four persons; it matters not how the removal, or "putting to bed," is executed, so it is with care, and an attention to the above points.

As soon as the mother can be safely left for a short time, and the nurse's attention to her can be dispensed with, the child, which had been warmly wrapped up and placed in some safe location, must be attended to. It must be washed and dressed. This is almost always the task of the nurse, or some female present; yet the practitioner should understand how it is to be done, in case inquiry be made of him, or he should be left in a condition where he would be required to act the part of nurse; a part, however, to which I most decidedly object, except in imperative cases.

The body and limbs should be lubricated with Sweet Oil, fresh Lard, or fresh Butter, which will assist in the more ready removal of the sebaceous matter with which the skin of the child is covered at birth, after which, warm soap-suds will be the only application required. If the above substance is not thoroughly cleansed from the skin, it may occasion painful and troublesome cutaneous excoriations. Be careful that, in washing and drying, the tenderness and integrity of the infant's skin be regarded, as too much pressure, or too much friction may bruise or abrade it; soft cotton, or linen should be used, both in the washing and drying. Some apply cold water to the infant, but this is wrong, and frequently injurious, requiring a very robust child to pass through the ordeal with safety. The child has just emerged from a situation of an elevated temperature, and a reduction of this temperature too suddenly, or too soon after birth, would, especially in those who are weak and delicate, be very apt to occasion serious and even fatal consequences. In washing the child's head, many nurses are accustomed to apply a small portion of warm spirits of some kind, for the purpose, as they say, of preventing its taking cold; whether this accomplishes the intention or not, there can be no objection to the practice, if too great a quantity of liquor be not employed.

After the washing, the accoucheur will be called upon to *dress the cord*; but previous to this, it will be proper for him to examine the child, and ascertain that it is not malformed. Some examine for this purpose, even before its washing. This having been done, a piece of soft linen must be doubled, so as to form a square whose sides measure six or seven inches; this is again doubled and folded in a triangular form, somewhat in the manner of preparing a paper filter, so that its point, which will be the center of the square when opened, may be applied to the flame of a lamp or candle, to form an opening of sufficient size, through which to pass the cord. I prefer making the orifice by burning instead of cutting, as its edges are thereby much softer and less liable to increase any existing irritation of the parts in contact with it. This is then opened, and through the orifice thus formed in the piece of linen, doubled, the cord is to be passed. The linen may now be allowed to lie upon the abdomen, and another piece placed over it and the cord, or the cord may be wrapped up in the first piece. But whichever plan is adopted, the cord must be placed upward along the abdomen, rather to the left, in order to avoid any compression of the liver, and secured in this position by a bellyband or bandage, passed, but not too tightly, around the child's body. If any blood be found to ooze from the end of the cord, previous to dressing it, another ligature must be applied nearer the umbilicus. The remaining piece of the funis umbilicalis dries up, and usually falls off in five or six days, though this may vary from two to sixteen days. It is not, commonly, necessary for the practitioner to examine the cord at subsequent visits, for every time the nurse bathes the child, she makes it a matter of duty to inspect its condition herself, and from her any information relative to it, under ordinary circumstances, çan be obtained. After the application of the bandage, the child should be lightly and loosely dressed, according to the season, and all cumbersome and tight clothes placed aside, as injurious to its health and welfare.

The child should be placed to the breast as soon as possible, for, in many instances, it will at once obtain a supply of the mother's milk; but should it fail to suck, or should no milk have been secreted, there will be no necessity for feeding it until several hours have elapsed. Some recommend it to be kept from the breast for ten or twelve hours; this may answer in cases where there is much exhaustion, or where the labor has been protracted; but in ordinary instances I prefer placing it to the breast as early as possible. Should it become advisable to feed the child, a little warm milk and water, without sweetening, or some thin gruel, will be the only food required; but after it obtains the mother's milk, no other food, whatever, should be allowed.

The substance collected in the intestines of the fetus, during utero-gestation, is called "meconium," and if it be not removed soon after birth, it will occasion gripings, colic, etc. The first breast-milk of the mother, secreted after delivery, is the best agent for the removal of the meconium; it is called *colostrum*, and contains, in addition to the common milk globules, numerous, large cells, or granular corpuscles, whose investing membrane is filled with oil, or common milk globules, similar to those which are floating free in the surrounding fluid. This colostrum appears to exert a laxative influence on the child, and is superior to any other agent for the above purpose; if it cannot be had within a few hours succeeding delivery, some Sweet Oil, or Castor Oil may be given, to effect the evacuation. I do not believe in dosing an infant with medicine as soon as it is born, for, owing to the customs and habits of society, it will become a charge to the physician soon enough, without attempting medication from the moment of birth; therefore, care and prudence should be manifested in making use of laxatives to purge off the meconium. And, above all things, for the sake of decency and of science, forbid that nauseous, abominable, and worse than heathenish practice, which some old nurses have, of forcing down the child's throat, a disgusting mixture of urine and molasses.

During these attentions to the child, the mother must by no means be neglected; her pulse should be examined from time to time, and other investigations pursued to ascertain the condition of the uterus, and whether any disposition to hemorrhage exists. The practitioner should NEVER leave the house for at least one hour after the delivery of the placenta, and he who leaves earlier than this, is criminally guilty of the loss of his patient, should she, shortly after his leaving, die, from uterine hemorrhage. There is no excuse for him. If it is absolutely necessary for him to leave the house, previous to the termination of the hour, let him have another physician called in, to temporarily supply his place. If the labor has been a tedious one, or the patient is much exhausted, or if the womb does not contract properly, the house should not be left for even a longer period than an hour, depending however, upon the circumstances of the case.

When about to return home, the accoucheur should place his hand upon the patient's abdomen, to learn whether the uterus is small, hard and contracted; he should examine the condition of the pulse, and likewise request the nurse to show him the cloth which had been placed at the vulva, that he may form some idea of the quantity of blood discharged. He should direct a simple diet of toast and tea, gruel, barley-water, and similar articles, and positively prohibit the admission of friends into the parturient room, for a period of at least twenty-four hours; the room must be kept comfortably warm, and properly ventilated without exposure of the patient, and perfectly free from any noise or excitement. He should leave the most positive orders that the female shall not assist herself in anything, and especially that she continue in the horizontal position, for even the momentary semi-erect posture has frequently occasioned alarming hemorrhage; and he should also ascertain that the bandage is properly secured.

CHAPTER XXV.

ATTENTIONS REQUIRED SUBSEQUENT TO DELIVERY, DURING THE PUERPERAL STATE.

In about twelve hours the patient should be again visited by her medical attendant, and even sooner than this, where the labor has been tedious, or where there is a disposition to hemorrhage. As with the process of natural labor, so with the puerperal state, when uninterrupted by accidents, no interference is required on the part of the practitioner; the patient will gradually attain her normal condition, unaided; yet as many females, who pass through their labors with safety, perish in the subsequent puerperal condition from inflammatory attacks, it is the duty of the attendant to superintend this condition, that he may at once adopt the proper measures to remove any abnormal symptoms that may arise.

The shock to the nervous system from labor, effects a derangement varying from mere restlessness to absolute hysteria; in easy labors, the patient soon recovers from it, requiring only a state of rest and sleep. When severe, it is characterized by symptoms of exhaustion, with an alteration in the appearance of the eye, an anxious countenance, derangement of the brain, the sensibility of which is either diminished or increased, and a disturbance of the circulating and respiratory system, as manifested by the pulse, which is slow and labored, or rapid and fluttering, or alternating from slow to rapid, and which must not be mistaken for the pulse of peritonitis, and also by the hurried, panting breathing.

The pulse will be found to increase during the second stage of labor, to diminish after this is completed, and to rise again on the secretion of the milk. A pulse ranging from 100 to 110 in the puerperal state, should be watched, though it is not always indicative of danger. A quick pulse may be present when a large clot is in the uterus, it may occur with diarrhea, gastric disturbance, or severe after-pains; and when found immediately after delivery, it frequently indicates hemorrhage. A quick, feeble, fluttering pulse occurs in the collapse from the nervous shock. There is a sensation of fatigue experienced in the shoulders and in the muscles of the abdomen, which sometimes persists for three or four days. It is occasioned by the muscular efforts made during the second stage of labor, and which may be discriminated from peritonitis, by the pulse not being increased, by no aggravation of the pain on pressure, and by the absence of febrile symptoms. When these symptoms are not very severe, they will subside upon keeping the patient quiet, and free from excitement, together with a few hours sleep. If severe, small doses of the compound powder of Ipecacuanha and Opium may be administered with advantage, and to each dose of which a grain or two of Caulophyllin may be added. In some instances equal parts of Xanthoxylin, Caulophyllin, and Scutellarin, may be mixed together, and given in three-grain doses every hour or two. The diet should be nutritious, the patient kept quiet, prohibiting the visits of friends, and for a few days nursing may be avoided. When symptoms of collapse or great exhaustion are present, stimulants may be allowed, as a moderate quantity of brandy and water, wine, or aqua ammonia, and these may be given in conjunction with the compound powder of Ipecacuanha and Opium. The stimulants must be omitted as reaction comes on, for if continued beyond this, they will be likely to produce mischief.

The *vagina*, notwithstanding its great distension, soon recovers its normal size, and the heat and soreness speedily disappear, unless the labor has been protracted during the second stage, or the lochial discharge becomes acrid. The *integuments of the abdomen* do not so readily recover their natural condition; they remain loose and flaccid for a long time; but if the bandage be properly applied, the only evidence of pregnancy which they afford, will be the white streaks on the external surface of the abdomen, *lineæ albicantes*. *The contractions of the uterus* after delivery, not only reduce its size, but prevent uterine hemorrhage, remove all substances from within its cavity, and diminish the caliber of its vessels and sinuses. The contraction, however, is not permanent, but is followed, after a short time, by an interval of relaxation; and these alternate contractions and relaxations continue for eight or ten days, during which time the organ can be felt and examined through the relaxed walls of the abdomen, after which it becomes so reduced in size as to descend into the pelvis, when it can no longer be distinguished through the abdomen. A day or two after delivery, the lining membrane of the internal cavity of the uterus, appears loose, somewhat softened, wrinkled, and covered, more or less, with patches of decidua. At the placental site the part is raised, and the surface is unequal, like a granulating ulcer, and its size is very much reduced. The whole internal surface of the organ is of a dark ash color, with a greenish or brownish discharge upon it, which has been mistaken for a gangrenous condition. The uterine structure is not so dense as in its natural state; its fibers are more distinct, and the sinuses are still evident, being filled with clots of blood at the placental site. The os and cervix uteri appear bruised and ecchymosed, and small lacerations or abrasions may sometimes be observed, which occasionally degenerate into ulcers. The orifice remains open for several days, closing gradually.

The contractions of the uterus, which ensue after delivery, are usually accompanied with more or less pain, termed AFTER-PAINS, and which are more common to multiparous women than primiparous; being most generally absent in the latter. Females who are the subjects of dysmenorrhea are said to be the most liable to these pains, which vary greatly in their severity and duration. They commence soon after delivery, say from half an hour to an hour, and continue from twenty-four to sixty hours. No bearing-down efforts accompany them, nor is the frequency of the pulse increased. These pains are useful not only in reducing the uterus to its non-gravid condition, but, by expelling coagula, pieces of membrane, and the fibrinous clots which plug up the sinuses, they prevent irritative fever. They are frequently brought on, or increased, upon applying the child to the breast, which is an argument in favor of this being done at an early period after delivery, in order to assist in promoting these contractions and thereby lessening the risk of hemorrhage.

After-pains may be usually distinguished from peritonitis, by their periodical returns, by being unaccompanied with fever or an excited pulse, by the persistence of the secretion of milk, and the discharge of the lochia, and by not increasing in severity upon pressure, though it must be recollected that the muscles of the abdomen may feel sore when pressed upon. They require no treatment unless severe, when they may be overcome by the administration of Caulophyllin, compound powder of Ipecacuanha and Opium, or these combined; a mixture consisting of Camphor one-third of a grain, Caulophyllin one grain, and Cimicifugin one grain, has also been given with benefit—the dose may be repeated every two or three hours. Should the pains resist the use of these agents, and which resistance will usually be found to depend upon retention of coagula, the rectum should be unloaded by a purgative enema, and hot fomentations should be applied to the abdomen, which will cause a prompt discharge of the clots, followed by immediate relief to the patient. Other remedies have been recommended in this difficulty, but I have found the above all-sufficient in the numerous cases which have come under my notice. There is a species of pain, of a very excruciating character, which sometimes follows delivery; it does not intermit like the ordinary after-pains, but is continuous, and is local
in the coccyx and extremity of the sacrum. It may be relieved b
ducing an opiate suppository into the rectum, or by the i
istration of the compound powder of Ipecacuanha and Op

Rheumatism of the uterus may render the retraction of this organ after delivery, very imperfect, causing it to continue enlarged above the superior strait. In this case the after-pains are prolonged and very severe, and the want of sufficient contraction upon the bleeding vessels may give rise to profuse hemorrhage. This may be overcome by pursuing a treatment similar to that named in Chapter XXVIII, on "Difficult Labor" in the first stage, under the head of Rheumatism of the Uterus.

In addition to the above-named conditions, there are several others, which it is important to inquire into upon the first visit after delivery; among these may be named *the state of the excretions*. During the second stage of labor, perspiration becomes quite copious, diminishing after the delivery, but not immediately returning to the ordinary standard; sometimes it has a greasy feel, and a sickly odor, and the skin is soft and flabby, gradually returning to its natural state.

Particular inquiry should be made as to the *urinary discharge*, and on this point the practitioner should fully satisfy himself. It is frequently the case, that the patient is unable to void the urine, or it passes with difficulty, and in small quantity. This may distend the bladder, giving rise to pains, fever, violent spasms, and, perhaps, rupture of the bladder. Pressure of the head upon the bladder and urethra, during its passage through the pelvis, usually occasions this difficulty. Whenever there exists any want of free urination, the bladder should be at once emptied by means of a catheter, which may have to be used several times before the parts recover their tone sufficiently to do without it. In attending to the evacuations, the patient should never be allowed to rise in the bed; it has often been the case that a sudden rising up in bed, within a few days after delivery, especially when this has been accompanied with hemorrhage, has been followed by immediate death. Dr. Meigs considers this to arise from the "*heart clot.*" The excessive loss of blood disposes the remaining portion of this fluid circulating in the system to a ready coagulation; consequently, if on rising, the debilitated patient should faint, the activity of the circulation is impeded, and a mass of coagulated blood forms in the heart, filling it so that the circulation can not be re-established, and death must ensue; or, if this does not supervene, restoration takes place very slowly, with symptoms of restlessness, difficult respiration, and peculiar action of the heart. Dr. Meigs says, that he has not seen a patient, struggling and breathing violently, from the above cause [illegible] ever recovered.

The *condition of* [illegible] ise be inquired into; if the patient is doi [illegible] ne evacuation, previous to delivery, there will be no necessity for any medication in two or three days. But, if the bowels were costive, or if there are febrile symptoms, restlessness, with slight pain upon pressure of the abdomen, some mild laxative medicine should be administered. Castor Oil is the agent most generally employed for this purpose, but many females have an aversion to it, consequently other laxatives will have to be used, as the compound powder of Rhubarb, or an infusion of Senna and Cream of Tartar, etc. I have frequently been called to patients, several days after their delivery, who were suffering from pains in the abdomen, headache, restlessness, and febrile symptoms, caused by the medical attendant having neglected to evacuate the bowels, and in whom all these symptoms disappeared, after the action of a dose of purgative medicine. This inattention to the condition of the bowels of the puerperal female, appears to constitute a part of the practice of a certain class of physicians. It is, however, a very reprehensible omission.

The LOCHIA is a discharge which takes place from the partially closed vessels of the uterus, and generally lasts five or six days, or longer, until the womb is restored to its normal size; though with some females, the discharge continues until the reappearance of the menses. It is, at first, bloody, but in twelve or thirteen hours becomes thinner and paler, changing to a discharge of bloody serum. According to its color, the lochia is distinguished by the names of sanguineous, sero-sanguineous, and purulent or puriform; it exhales a peculiar, disagreeable odor, varying in intensity with different women, which is called *gravis odor puerperii*. During the milk-fever, this discharge generally ceases, but returns on its subsidence, being then of a yellowish-white color; it varies in quantity, being with some women very small, while others will soil from six to fifteen napkins in the twenty-four hours; but this quantity gradually diminishes, and the discharge assumes a greenish or paler color before it ceases. The lochial discharge serves to relieve congestion, and to lessen the chances of an inflammatory attack; during fever, it becomes checked, hence, its presence is indicative of the absence of fever.

Generally, the lochia requires no interference; it is only when its condition affects the health of the patient, that medical attention will be needed. Thus, it may be very small in quantity, but continue
usual time without any unpleasant results, and which is apt to
after flooding; or it may be abundant, and cease at the usual
without any detriment to health; or, it may stop shortly after

without any evil consequences, as is frequently witnessed in the case of still-born or putrid children.

Sometimes, however, the discharge is very *excessive*, producing much debility; in these cases, remedies must be employed which will diminish the quantity of the flow, as well as strengthen the patient's system. To check the discharge, astringents may be employed; a mixture of equal parts of Geraniin and Caulophyllin, may be given, in doses suited to each particular case—commonly, one or two grains of each, repeated every hour, will be sufficient. As tonics, Quinia, preparations of Iron, or some of the ordinary vegetable bitter agents, may be used; the diet of the patient should be more nourishing, but not stimulating, and she should be kept in a state of rest and quietude. If with the excessive discharge, there is vascular excitement, as quick pulse, heat of surface, furred tongue, pain in the back, etc., the patient should be placed on a low, mild diet, with cooling drinks, the bowels must be gently moved by Seidlitz Powders, or other cooling laxative, and the compound powder of Quinia may be administered with advantage; sometimes the febrile symptoms may be overcome by the saturated tincture of Aconitum root, given in doses of three drops in a teaspoonful of water, and repeated every hour or two. I have combined the saturated tinctures of Aconitum root and Cimicifuga, in the proportions of one part of the former to two of the latter, and have employed the mixture with advantage, in doses of eight drops in a teaspoonful of water, every hour or two. Beside the sedative and antiphlogistic influence exerted on the system by these agents, we also obtain the peculiar tonic action of the Cimicifuga upon the uterus, thus rendering the compound a highly desirable one. The generative parts should be bathed with cool water, three or four times a day. Should the increase of the flow be owing to the presence of a portion of the placenta within the uterine cavity, and which may be presumed, if the discharge is offensive, with vomiting, the vagina and uterus may be syringed two or three times daily with some tepid, astringent infusion, as of Geranium, Hamamelis, Quercus, etc.; and if the offending portion can be easily removed, it should be done, when the symptoms are very urgent. Generally, however, the uterus will evacuate its contents with more safety, when not interfered with by injections or manual operations.

At times, the lochial flow, after having diminished in quantity, suddenly becomes increased and of a red color; this arises from the patient sitting up too soon, or, at a later period, from too much exercise, as of walking. Rest in the recumbent position will, usually, be the only treatment needed; but should it prove obstinate, the red discharge still continuing, secondary hemorrhage may ensue, for which the practitioner must be prepared—Ergot, Caulophyllin, Oil of Fireweed, Geraniin, Warren's Styptic Balsam, etc., are among the articles that may be used in these instances, together with a confinement to the horizontal position.

The lochia may be *checked*, or *deficient in quantity*, from other causes than uterine contraction, in which cases, febrile symptoms will be present; and if the discharge be not promptly restored, it may form the basis of some fatal disease. The treatment which I have found to be most commonly beneficial, is, to evacuate the bowels by a mild purgative, after which, the patient is made to drink freely of a strong infusion of the herb Leonurus Cardiaca, as hot as can be borne, at the same time bathing the groins, thighs, and inferior extremities with the officinal compound tincture of Camphor. A plant called *Winter Fern*, is much employed, in infusion, in many parts of the country for the same purpose as the Leonurus, and, it is said, with considerable success, but I am unacquainted with it. A large poultice of Elm bark, sprinkled with three or four drachms of pulverized Camphor, and applied over the vulva and abdomen, has also proved serviceable.

When the above treatment fails to remove the abnormal symptoms, they may be owing to inflammation of the uterus, or other local inflammation, which will require to be treated upon general principles. I would remark here, however, that the combination of the tinctures of Aconitum and Cimicifuga, above mentioned, with attention to the condition of the bowels, and warm fomentations to the abdomen, have been employed in my own practice very successfully. Recently, I have administered the tincture of Gelseminum, in these cases, with the most remarkable results. A similar course may be pursued where the diminution of the lochial discharge is owing to uterine rheumatism, which is apt to be the case when the uterus is attacked by this disease. (*See Chapter XXVIII.*)

Sometimes the lochia has a very fetid odor, is acrid, and of a dark color; this may be owing to putrefaction of retained coagula, or decomposition of pieces of the placenta or membranes which have been left within the uterus. An injection of warm water, of some warm astringent infusion, or of a very weak solution of chloride of lime, passed into the vagina two or three times daily, will be found sufficient to remove the fetor. When the discharge continues of a purulent character, long after delivery, with lumbar pains and sense of weight accompanying, it may be owing to ulcers, or abrasions of the cervix or vagina, which will have to be determined by the speculum, and treated accordingly. When the lochia is acrid, an infusion of Elm-bark and Black Cohosh root, may be injected into the vagina, several times a day, with advantage.

With some women the *secretion of milk* is attended with considerable vascular excitement; rigors, headache, pains in the back and limbs, quick pulse, furred tongue, etc., are present in a greater or less degree. This condition is termed *milk-fever*, and is by no means common to every parturient woman; it usually manifests itself in two or three days after delivery; occasionally sooner, and sometimes later. It may generally be avoided by placing the child to the breast as soon after labor as is compatible with the strength and condition of the mother, and by the early administration of a purgative. It commonly lasts for twelve or twenty-four hours, rarely forty-eight, and may be overcome by the use of cooling purgatives, fomentations to the breasts, if they are full, hard, and painful, and the frequent application of the child. When very severe, diaphoretics may also be given. When the rigors are very intense, or when the fever assumes periodicity, febrifuges and antiperiodics must be administered, and the practitioner should be on his guard lest it be attended with puerperal peritonitis.

Milk-fever is often occasioned, or aggravated by too long a delay in giving suck to the child, and which may arise from deficient, mal-formed, or sore nipples. Where the nipples are deficient or mal-formed, the milk will have to be extracted by artificial means, as the breast-pump. The secretion of milk is liable to become diminished when the uterus is suffering under a rheumatic attack; and this, together with the severe pain, diminution of lochia, pain on pressure, etc., may be readily mistaken for peritonitis. *(See Chapter XXVIII.)*

Excoriation and *ulceration of the nipples* is a very common affection among nursing women, indeed, some suffer severely from it after every confinement. It is, sometimes, so severe and painful that it is impossible to bear the application of the child's mouth to the nipple, and, in some instances, a persistence in suckling, gives rise to large, foul, painful, superficial ulcers, or deep cracks, which bleed upon every application of the child; occasionally, the woman loses her nipple. This difficulty may be obviated, by the use of artificial shields, or prepared teats, which can be had in every drug-store; but frequently the child refuses to suck with them, and the aid of the physician is demanded. Whenever inflammation is present, it must first be subdued, previous to the application of any healing salve or ointment. This may be effected by a poultice of Elm bark, or Flax-seed, which should cover the whole nipple and areola, after which any of the preparations named below may be applied. Sometimes, the inflammation will be so intense, as to require the application of a few leeches on the breast outside of the areola, before any benefit will result from the emollient poultices. The severe pain may frequently be relieved by a careful application of a solution of Nitrate of Silver to the excoriated parts only; the solution may be of the strength of from two to six grains of the salt to the fluidounce of water.

After the reduction of the inflammation, and in those cases where it is but slight, the following applications have been recommended: 1. Take of Spermaceti Ointment six drachms, Balsam of Peru one drachm; mix together, and apply a small portion to the nipples, several times a day. 2. Take of Mutton Suet one ounce, Balsam of Peru two drachms, Honey, Glycerine, of each one drachm; melt the Suet, and add the remainder of the articles, stirring well together. Use same as above. 3. Take of Balsam of Tolu, Balsam of Peru, Honey, of each, fourteen drachms, Camphor, Opium, of each, two drachms, Alcohol two pints; mix together and allow them to stand for seven days, frequently agitating them. A piece of linen is to be moistened with this, and kept constantly applied to the nipple when the child is not suckling; if too severe, it may be slightly diluted with water. It must be washed off every time previous to the application of the child. I have used this successfully, in many cases. 4. Take of Beef-marrow, Olive Oil, white Wax, of each two ounces, Cherry Wine, made of common cherries (*Cerasus avium*, *C. vulgaris*, *etc.*), two fluidounces; place the articles together in a vessel, apply it over a gentle heat, and allow it to remain until all the wine has evaporated. This ointment may be applied just previous to the child's suckling, and immediately after. Should the child's mouth be sore, this will have a tendency to heal it. It forms an elegant preparation, one which I have successfully employed in the most distressing and obstinate cases. And as my object is to render this work one of practical utility, even in minor difficulties, I do not hesitate to give publicity to these small details. I have frequently been called upon to prescribe in cases of sore nipples, which had baffled the treatment of four or five preceding medical attendants, but which yielded at once to the course above-named. Borax-water, Cucumber ointment, ointment of Poplar buds, and Castor Oil, have likewise been advised as local applications: I have not used them.

After having bestowed the proper attentions to the mother, and ascertained the condition of the bowels, bladder, uterus, lochia, pulse, breasts, etc. the practitioner may then inquire concerning the child. Whether it has had evacuations from the bowels and bladder, and whether it sucks. In cases where the urine is scanty, or where there has been no urinary discharge, and the parts are natural, requiring no surgical operation, the application of pounded garlic, or onions over the pubic region will be very serviceable; if, however, these do not cause a copious urinary discharge, and the hypogastric region be swollen from accumulation of fluid in the urinary bladder, it may become necessary to introduce a small flexible catheter, in order to remove the urine, and which will be found a difficult operation, requiring great care. If the bowels have not been evacuated, and there is no imperforate anus requiring the surgeon's aid, a mild laxative, as before remarked, may be given; Castor Oil is usually preferred. The clothing of the child should be warm, and loosely applied, that it may be free in its motions; caps are to be avoided as injurious; the dress should be high up on the neck, with long sleeves; and the diapers must be soft, and never allowed to become dry and stiffen with the excretions, and thus give rise to troublesome excoriations.

The only proper food for an infant, is its mother's milk, and when this can be obtained, little else should be given it, for at least six or seven months. All paps, panadas, gruels, and cordials are to be avoided, and their use among infants, as food, cannot be too severely censured. Colics, diarrheas, green and watery stools, and severe aphthous affections are the penalties of such unnatural practices. When the mother's milk cannot be had, from whatever cause, and a wet nurse is not at hand, and it becomes necessary to feed the child, a mixture of one part of water to two or three parts of cow's milk, and warmed, forms an excellent substitute for the parent fluid. The milk used should be procured from one cow regularly, and be given as soon as possible after it has been milked out. The addition of sugar to the preparation, as advised by some writers, I consider uncalled for and pernicious, frequently producing diseases of the stomach and bowels, which are attributed to other causes. The following table, by Simon, showing the mean of fourteen analyses, made at different periods, with the milk of the same woman, and which very nearly corresponds with the analyses of other investigators, will conclusively show the folly of adding sugar to a preparation intended to supply the place of breast-milk.

Water, ...	883.6
Solid constituents, ...	116.4
Butter, ...	25.3
Casein, ...	34.3
Sugar of milk, and extractive matters, ...	48.2
Fixed salts, ...	2.3

And as to the sugar of milk, it very nearly corresponds in quantity to that of cow's milk, as may be seen by the following analysis of this animal's milk, by Chevallier and Henri:

Casein,	4.48
Butter,	3.13
Sugar of milk,	4.77
Saline matter,	0.60
Water,	87.02

It will be observed that cow's milk contains more casein and butter than human milk, which may, probably, lead to the production of a still better substitute for this last, than the one proposed above.

In feeding the child its artificial food, it should be done in a manner to simulate, as closely as possible, the natural functions; that is, it should not be fed with a spoon, but should be taught to suck from a vessel, through some porous substance, by which means the saliva is invited into the mouth to be swallowed with the food, which latter is thereby rendered more easily digestible.

The parturient woman should be kept in a state of rest and quiet for nine or ten days, in order that the uterus may return to its non-gravid size without hemorrhage, inflammation, or displacement, and that the system may fully recover from the shock given to it by the labor. The first two or three days, she must not be allowed to remove from the horizontal position, especially if the labor has been protracted, or if there has been hemorrhage; after this time, if not contra-indicated, she may be permitted to sit up in bed a few minutes at a time, or in a chair, while the bed is being fixed, and should from this time, lengthen the duration of sitting each day, until there is no further occasion for remaining in the bed. The room should be well ventilated, but without exposing the patient, and be kept clean, quiet, free from all unpleasant odors, and moderately warm. The female should be kept clean, especially about the genitals, which must be frequently bathed with lukewarm water, or warm water and spirits; and her diet must be light and of easy digestion, especially during the first days. Gruel, mush and milk, toast, panada arrowroot, rice, etc., are all that can be permitted until the fifth or sixth day, when, if she be doing well, the use of soft-boiled eggs, oyster, and weak soups, may be allowed. After the tenth day, and during the puerperal month, animal food, fowls, and other diet of a nourishing but non-stimulating character, may be given; if she be weak, a little porter will be admissible.

If the patient, previous to pregnancy, was afflicted with prolapsus uteri, a continued recumbent position for eight or ten weeks after delivery, will contribute much toward a radical cure.

The visits of the practitioner should be daily, for the first two or three days, or oftener, if required; after which, a visit every second or third day, made on two different occasions, will be sufficient in ordinary cases. However, this is governed by custom; in some places, after the first visit succeeding delivery, no other is made, unless the physician is sent for; in others, the visits are continued more or less often, as may be required, until the ninth or tenth day. I consider the last-named plan of visiting, the preferable one, both as regards the safety of the woman, and the reputation of the accoucheur.

CHAPTER XXVI.

PRESENTATIONS AND POSITIONS.

For the purpose of more clearly understanding the mechanism of labor, it is necessary that a knowledge of the various presentations and positions of the fetus, be had. By the term *presentation*, in obstetrics, is meant the part of the fetus which occupies the pelvic superior strait at the commencement of labor; while *position* designates the relations which the presenting part assumes with the circumference of this strait, or with some fixed point. Thus, if it is said *the vertex presents*, we understand it to mean a presentation of the head, in which the head of the child will be the part first delivered; if it is still further said, that it is in *the left occipito-anterior position*, we learn that the occiput of the child looks toward the left acetabulum of its mother, while its forehead is toward her right sacro-iliac symphysis, and the sagittal suture will consequently be found running in an oblique direction in the pelvis between these two points—or, in other words, we have the *position* in which the head *presents*.

There are two PRESENTATIONS recognized in obstetrics—one Cephalic, the other Pelvic. The cephalic, is divided into vertex, face, and shoulder presentations; the pelvic, into breech, knees, and feet. Occasionally, some portion of the trunk may present, or perhaps the ear and side of the head, but these are so extremely rare, as to form exceptions rather than exemplifications; and their management would be similar to that recommended for arm or shoulder presentations.

The most common, as well as the most favorable presentation for both mother and child, is that of the vertex or head, and which alone constitutes a natural labor; the others are only deviations. That this is the fact may be gathered from the following statistics: Bland records 1792 head presentations in 1897 cases of labor; Dubois 10,262 in 10,742; Kluge 257 in 298; Lovati 61 in 67; Mazzini 439 in 452; Nægèle 1,210 in 1,296; Pacord 49 in 58; Ramoux 266 in 275; Riecke 214,134 in 219,258; Siebold 132 in 137; Smellie 920 in 1,000; and Velpeau 392 in 400.

The relative frequency of the various presentations, are given in the following table, taken from Churchill's Obstetrics:

Author.	Total No. of cases.	Head presentations.	Breech presentations.	Inferior extremities.	Superior extremities.
Mad. Boivin,................	20,517	19,810	372	238	80
Mad. La Chapelle,.........	15,652	14,677	349	255	68
Dr. Jos. Clarke,...........	10,387	9,748	61	184	48
Dr. Merriman,.............	2,947	2,735	78	40	19
Dr. Granville,..............	640	619	2	3	1
Edin. Hospital,.............	2,452	2,225	17	8	4
Dr. Maunsell,..............	839	786	—	21	4
Mr. Gregory,...............	691	645	14	7	4
Dr. Collins,.................	16,414	15,912	242	187	40
Dr. Beatty,..................	1,182	1,105	28	15	4
Dr. Lever,...................	4,666	4,266	59	29	12
Dr. Churchill,..............	1,640	1,119	85	22	9

The POSITIONS of the two presentations and their divisions or deviations, vary considerably, so much so that some authors have given one hundred and two distinct positions. (*Baudelocque.*) But these have recently been so reduced and simplified by Nægèle, Dubois, Stoltz, and other accoucheurs that the whole of them may be comprised in sixteen positions, and which will be found fully sufficient for all practical purposes. The many slight alterations and deviations in position, which may occur with the several presentations, and which have given rise to the numerous positions above referred to, may, singly, either be reduced to some one of the distinct positions, hereinafter named, before the termination of labor, or may hold such a close relation to it, as to require no material difference in its management.

In a VERTEX PRESENTATION, although it may become necessary to determine the situation of the anterior and posterior fontanelles, and the direction assumed by the sagittal suture, in order to ascertain its position, yet it is the posterior fontanelle alone, which distinguishes the situation of the occiput; and, this fontanelle, in all natural labors, is the most readily reached by the finger. A vertex position is characterised by the relation existing between the occiput of the fetus, and the acetabulum, symphysis pubis, or sacro-iliac symphyses of the maternal pelvis. Thus then, the positions of a vertex presentation, may be arranged as follows:

POSITIONS OF VERTEX PRESENTATION.

1st. LEFT OCCIPITO-ANTERIOR, in which the occiput of the child looks toward the left acetabulum of the mother, or anteriorly and to the left of the pelvis. In this position the forehead of the child, and consequently the anterior fontanelle, will be found toward the right sacro-iliac symphysis, the sagittal suture running obliquely across the pelvis anteriorly from the left, to the right posteriorly. This position has also been called the *left occipito-cotyloid.*

2d. RIGHT OCCIPITO-ANTERIOR, in which the occiput of the child looks toward the right acetabulum of the mother, or anteriorly and to the right of the pelvis. In this position, the anterior fontanelle will be found toward the left sacro-iliac symphysis, the sagittal suture running obliquely across the pelvis anteriorly from the right, to the left posteriorly. This position has also been called the *right occipito-cotyloid.*

3d. OCCIPITO-PUBAL, in which the occiput faces the symphysis pubis of the mother, or is placed anteriorly without any lateral obliquity. In this position, the anterior fontanelle will be toward the sacrum, the sagittal suture running in the direction of the antero-posterior diameter of the pelvis.

4th. LEFT OCCIPITO-POSTERIOR, in which the occiput looks toward the left sacro-iliac symphysis of the mother, or posteriorly and to the left of the pelvis. In this position, the forehead of the child, or its anterior fontanelle, will be found toward the right acetabulum, the sagittal suture running obliquely across the pelvis anteriorly from the right, to the left posteriorly, as in the second position. This position has also been called the *right fronto-cotyloid.*

5th. RIGHT OCCIPITO-POSTERIOR, in which the occiput looks toward the right sacro-iliac symphysis of the mother, or posteriorly and to the right of the pelvis. In this position, the forehead of the child, or its anterior fontanelle, will be toward the left acetabulum, the sagittal suture running obliquely across the pelvis anteriorly from the left, to the right posteriorly, as in the first position. It has also been called the *left fronto-cotyloid.*

6th. OCCIPITO-SACRAL, in which the occiput faces the sacrum of the mother, or is placed posteriorly without any lateral obliquity. In this position the anterior fontanelle will be found toward the symphysis pubis, the sagittal suture being in the same direction as in the third position.

The student can readily master a knowledge of these positions, if, taking the vertex or occiput as the guide, he will bear in mind, that it may be placed either *anteriorly* or *posteriorly* in the maternal pelvis, and that, commencing with its anterior position as the first, he has merely to give to it the directions, *left*, *right*, and *front*. Thus, vertex to the left anterior, vertex to the right anterior, vertex anterior, vertex to the left posterior, vertex to the right posterior, and vertex posterior. Professor Meigs simplifies the positions, the better to impress them upon the student's mind, thus: "vertex left, vertex right, vertex front; forehead left, forehead right, forehead front;" and which enumeration is, undoubtedly, as he remarks, "the easiest one to remember." The importance of a knowledge of these positions, is, that in cases where an interference is demanded, the accoucheur may have a certain guide by which to govern his operations, with an eye to the safety of the mother, as well as of the child; and, without this knowledge, any assistance which may be attempted, is more likely to effect mischief than benefit. And I hold a man, who is ignorant of these matters, criminally responsible for any fatal consequences that may follow his rash attempts to accomplish—*he knows not what*. Nor is the excuse, "that he has no malice or evil feeling toward his patient, but was endeavoring to do the best he could for her," a valid one—he has no right, whatever, even with the authority of a diploma, to undertake a practice which concerns health and life, with an entire ignorance of his duties; the very attempt alone, is, in my estimation, criminal.

When the head presents well flexed, it is a vertex presentation, but when extension has occurred, it then becomes a FACE PRESENTATION, in which but two positions are recognized. In the diagnosis of face positions, the mentum or chin of the child, must be taken as the guide.

Although the labor in face presentations is tedious, and more painful to the mother, and somewhat more dangerous for the child than in vertex presentations, yet, we find that in the majority of cases they terminate naturally, and without any artificial aid. From statistics collected from French, German, and English authorities, it appears that in 136,123 cases, the face presented in 640, or about 1 in 212½ cases, so that these deviations of the natural vertex presentation are very rare. As to the labor, we have a record of 344 cases, in which 248 were delivered naturally, 42 required version, 20 the forceps, and 15 craniotomy. The mortality to the mother averages about 1 in 50; to the child 1 in 7; and it has been found the greatest to both mother and child in those cases where assistance was given; so that the necessity for interference is not so great as was formerly supposed.

POSITIONS OF FACE PRESENTATION.

1st. LEFT MENTO-ILIAC, in which the child's chin is to the left side of the maternal pelvis, and its forehead to the right side.

2d. RIGHT MENTO-ILIAC, in which the chin of the child is to the right side of the mother's pelvis, and its forehead to her left side.

Some authors give two other positions, one the *mento-sacral*, in which the chin is toward the sacrum, and the forehead toward the pubic symphysis, and the other, the *mento-pubic*, exactly the reverse of the preceding one. The former is said to be extremely rare, and I very much doubt whether it can occur, except in children with very small heads, or in premature labors. The latter is likewise seldom met with, although it is the position which the two principal positions assume at the termination of labor.

A SHOULDER PRESENTATION may be considered a deviation of the cephalic presentation, and includes those of the arm, elbow, and hand; according to statistics it has occurred 358 times in 93,398 cases, or about 1 in 260⅞, and its mortality to the mother is about 1 in 9, while of the children rather more than one-half have been lost. There are four shoulder positions; two for each shoulder, and the points by which the practitioner is to be guided in his diagnosis, are, the head of the fetus, and the ilium of the mother; some authors name the back of the fetus instead of its head. The right arm or shoulder presents oftener than the left.

POSITIONS OF SHOULDER PRESENTATIONS.

FIRST LEFT CEPHALO-ILIAC, in which the *right shoulder* presents, the head of the fetus being in the maternal left iliac fossa, its face looking posteriorly, and its back anteriorly. This is likewise called the *first anterior dorsal position.*

SECOND LEFT CEPHALO-ILIAC, in which the *left shoulder* presents, the head of the fetus being in the maternal left iliac fossa, its face looking anteriorly, and its back posteriorly. This is likewise called *the first posterior dorsal position.*

FIRST RIGHT CEPHALO-ILIAC, in which the *right shoulder* presents, the head of the fetus being in the maternal right iliac fossa, its face looking anteriorly, and its back posteriorly. This is likewise called the *second posterior dorsal position.*

SECOND RIGHT CEPHALO-ILIAC, in which the *left shoulder* presents, the head of the fetus being in the maternal right iliac fossa, its face looking posteriorly, and its back anteriorly. This is likewise called the *second anterior dorsal position.*

The PELVIC, or BREECH PRESENTATION, is divided into four positions, the sacrum of the fetus being the diagnostic guide. In this presentation, the delivery is generally accomplished by the natural powers, without the intervention of art, though it is slow, tedious, and painful to the mother, and more dangerous to the fetus than vertex, or face presentations; the mortality to the child is owing to pressure of the os uteri on its body, which, by forcing the blood toward its head, produces congestion of that organ; it may also be owing to the tardiness of the labor, and the compression of the cord during the delivery of the head. Why the breech should present, has not been satisfactorily explained. Breech presentations have occurred, according to statistics, 2,438 times in 129,117 cases, or about 1 in 52, and the mortality to the child is recorded at 195 deaths in 678 cases, or about 1 in 3½. Knee and feet presentations are mere deviations from the breech, and are even more tedious and dangerous to the child than this, on account of the delay in the delivery of the head, the maternal parts not being so well dilated, as when the breech presents, with the extremities flexed upward. Knee presentations are rare, occurring about once in 3,445 cases; statistics give 1,268 foot and knee presentations in 117,640 cases, or about 1 in 92¾, and the mortality to the child is recorded at 210 deaths in 562 cases, or about 1 in 2½.

POSITIONS OF BREECH PRESENTATION.

1st. LEFT SACRO-COTYLOID, in which the sacrum of the fetus faces the left acetabulum of the mother's pelvis, while the posterior part of the fetal thighs, which are flexed upward, faces the right sacro-iliac symphysis. This position is also called the *left sacro-iliac.*

2d. RIGHT SACRO-COTYLOID, in which the sacrum of the fetus faces the right acetabulum of the maternal pelvis, while the posterior part of its flexed thighs, faces the left sacro-iliac symphysis. This position is also called the *right sacro-iliac.*

3d. SACRO-PUBIC, in which the sacrum of the fetus faces the maternal symphysis pubis, while the posterior part of its flexed thighs faces the sacro-iliac symphyses.

4th. SACRO-SACRAL, in which the sacrum of the fetus faces the maternal sacrum, while the posterior part of its flexed thighs faces the pubes of the mother.

Two other positions are given by some authors, in which the sacrum of the child is to one or the other of the sacro-iliac symphyses; I doubt very much whether these occur, except in very small children; and when they do, the management will be the same as in the positions given.

In KNEE PRESENTATIONS, the feet are always to be brought down; and the positions of the feet are determined by the heel; that is, 1st, heels to the left, or *left calcaneo-iliac*; 2d, heels to the right, or *right calcaneo-iliac*; 3d, heels to the front, or pubes, or *calcaneo-pubal*; and 4th, heels to the back, or sacrum, or *calcaneo-sacral*. The position of the heels enables us more readily to determine the position of the breech.

To briefly recapitulate, the presentations and positions are as follows:

Presentations.	*Positions.*	*Presentations.*	*Positions.*
VERTEX.	1. Left Occipito-anterior.	SHOULDERS.	1. First Left Cephalo-iliac.
	2. Right Occipito-anterior.		2. Second Left Cephalo iliac.
	3. Occipito-pubal.		3. First Right Cephalo-iliac.
	4. Left Occipito-posterior.		4. Second Right Cephalo-iliac
	5. Right Occipito-posterior.	BREECH.	1. Left Sacro-cotyloid.
	6. Occipito-sacral.		2. Right Sacro-cotyloid.
FACE.	1. Right Mento-iliac.		3. Sacro-pubic.
	2. Left Mento-iliac.		4. Sacro-sacral.

CHAPTER XXVII.

MECHANISM OF LABOR.

IT has been heretofore remarked, that presentation of the vertex is the most common of all; and among the positions, the *left occipito-anterior*, or that in which the occiput is directed toward the left acetabulum, is most frequently met with, occurring, according to statistics, about 69 times in every 100 cases. In 1,913 cases, reported by M. Dubois, 1,339 were left occipito-anterior, 494 right occipito-posterior, 55 right occipito-anterior, and 12 left occipito-posterior. Why the occiput is found so much more frequently in front, is difficult to determine; but its position at the left anterior of the pelvis, may be accounted for by the rectum on the left side, which, being usually distended with fecal matters, diminishes the right oblique diameter, so that the head being forced to traverse the most ample diameter, the occiput is thrown to the left acetabulum, and the forehead to the right sacro-iliac symphysis.

As already remarked, vertex presentations are always more favorable for both mother and child, than any other. The occipito-posterior positions are, however, less so than the occipito-anterior, in consequence of the difficult descent of the head, the more frequent demands for artificial aid, the greater liability of laceration, or perforation of the perineum, and from the delay in the advance of the head often creating sloughs, and urinary, or stercoral fistulæ.

The presence of a vertex presentation may frequently be recognised during the last few weeks of pregnancy, even before the finger can be introduced within the os-uteri; a regular, solid, rounded tumor may be felt through the inferior portion of the uterine parietes, which can be raised by the finger with more or less difficulty as the pregnancy is more or less advanced. And when, at the commencement of labor, the presenting part can not be easily reached, or the round, resisting surface of the head is not encountered, there may be some other than a vertex presentation, and the labor should be closely watched during the first stage, in order to determine, as soon as possible, the nature of the presenting part, and be thereby enabled to rectify, at the proper period, any accidents which may present themselves. Nægèle states, that various circumstances, independent of malposition, may occur, which will prevent the presenting part from being felt at the end of gestation; as in cases of multiparæ, where the uterine fundus is strongly inclined forward; in twin cases; in breech presentations; where a large quantity of amniotic fluid is present; where the uterus is not oval at its inferior part; when there is a hydrocephalous head; and where the pelvis is narrow. As soon as the dilatation of the os uteri has so far proceeded as to admit the introduction of the finger, during the absence of a pain, the large, rounded, smooth and solid surface of the head can be felt through the membranes, and if the dilatation be sufficient, membranous spaces, answering to the sutures and fontanelles, may be recognized; and if the head be pressed upon, a resistance of a somewhat elastic character may be noticed. After the membranes have ruptured, these diagnostic signs are more manifest.

After having correctly ascertained the presentation, the next thing will be to determine the position, and this should always be done at as early a period as possible, in order, the more readily to remedy any difficulties which may occur. The diagnosis can, in many instances, be effected previous to the rupture of the membranes; but, most frequently, it will be impossible to arrive at it, until after this has occurred, and then, it should always be accomplished without delay.

Auscultation has been spoken of, as affording aid in determining the position; thus, if the fetal heart is heard pulsating in the left iliac fossa, the occiput is to the left, and if in the right, it is to the right, etc.; but there is too much uncertainty in this mode of diagnosticating, to admit of its employment in actual practice; the examination per vaginam is the only one on which dependence must be placed. The same may be said in relation to the active motions of the fetus, whose anterior region is supposed to correspond with the point of the uterus at which these have been recognized for a long time. The practitioner may attend to these symptoms, for the purpose of verifying their accuracy, or of leading to a more positive determination of their real value; but he should not allow a labor to proceed solely upon the indications they afford.

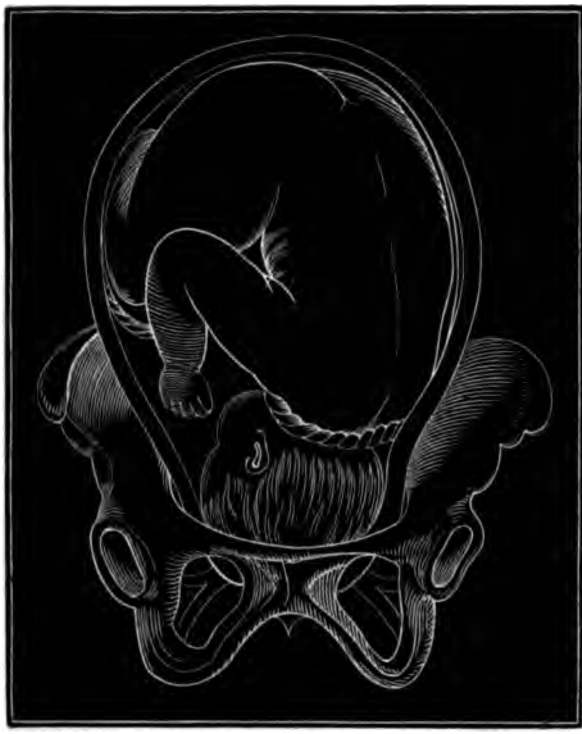
In order to arrive at the position of a vertex presentation, the accoucheur should render himself enabled to recognize at once, the character of the fontanelles and sutures, a description of which is given in Chapter VI, and the exploring finger should be pressed with sufficient firmness upon the head, to enable it to detect them. He must also bear in mind that, frequently, while the head is descending, the compression it undergoes, is such, that the bones are forced to overlap each other, and the sutures, instead of a membranous sensation, convey to the finger, one of longitudinal ridges or prominences; and the distinctive character of the posterior fontanelle especially, is lost, being recognized merely by the junction of the sagittal and lambdoidal sutures, or rather the longitudinal prominences which they present from the pressure.

1st. LEFT OCCIPITO-ANTERIOR POSITION.

DIAGNOSIS.—In this position, the finger, upon being introduced into the vagina, will first come in contact with the boss or protuberance of the right parietal bone of the fetal head, and not the posterior fontanelle, which latter will be found in the region of, and corresponding nearly to the maternal left acetabulum; the sagittal suture may then be traced running from this triangular fontanelle, obliquely across the pelvis, from below upward, and from before backward, and from left to right, until it meets with the large, soft, membranous, and quadrangular anterior fontanelle, which will be toward the right sacro-iliac symphysis. The back of the child will be toward the front and left of the mother's abdomen, while its abdomen will be toward her back and right;

its right shoulder will be in front and to the right, and its left, back and to the left. (*Fig.* 46.)

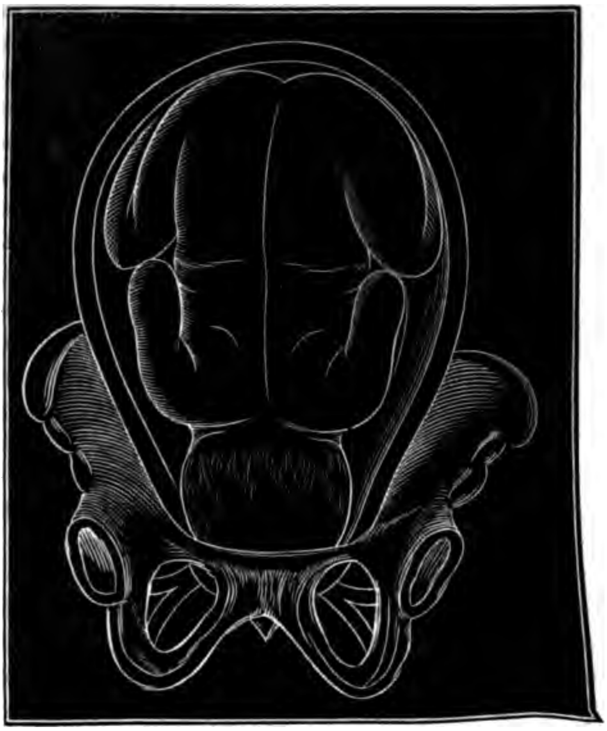
FIG. 46.



MECHANISM.—The waters having been discharged by the rupture of the membranes, the expulsive contractions of the uterus force the head, which presents obliquely at the superior strait, down into the brim of the pelvis, its flexion upon the chest is increased, so that the neck is bent more into a curve, and the body of the fetus is more or less compressed, and rolled, as it were, into a ball, occupying much less space than before. At first, the two fontanelles are nearly on a level, but as labor progresses, and the head advances, one of them, more commonly the posterior, will be found gradually descending, as the uterine contractions cause the vertex to sink. The flexion causes a change in the relations of the head. Previous to the rupture of the membranes, and the flexion of the head, the occipito-frontal diameter of the fetal head was parallel to the left oblique diameter of the superior strait, and the biparietal of the former coincided with the right oblique of the latter; but now, while the position of the latter diameters remains unaltered, the former changes, the occipito-bregmatic of the fetal head corresponding to the left oblique diameter of the strait, in place of the occipito-frontal. The axis of the pelvis, which, previous to the rupture, coincided with the trachelo-bregmatic diameter of the head, now corresponds very nearly with its occipito-mental. If the student will compare the diameters of the fetal head with those of the maternal pelvis, he will ascertain that this movement of flexion, brings the smallest diameters of the head in correspondence with the smallest of the pelvis, thus placing it in a position highly favorable to its ready expulsion.

The *descent* of the head is due to the continuation of the uterine contractions, which force it through the strait, into the pelvic cavity, and onward to the lower strait of the pelvis. In its passage through the pelvic excavation, it undergoes great compression, the bones overlap each other, as above stated, forming longitudinal ridges along the sutures, and sometimes, when the pressure is very considerable, a tumor is formed upon the scalp, called the CAPUT SUCCEDANEUM. The obliquity of the head at the superior strait is preserved throughout its descent, with the exception that one fontanelle is, most commonly, lower than the other. The contractions urge the head downward, the occiput descends on the left antero-lateral inclined plane, while the forehead moves in the direction of the right sacro-iliac symphysis, and the descent is wholly perfected, when the occipito-bregmatic circumference coincides with the plane of the inferior strait, or when the two protuberances of the parietal bones have arrived at this level, and to attain which, the left protuberance, which is behind, must traverse the whole anterior face of the sacrum, describing the arc of a large circle, while the right, which is anterior, traverses a shorter distance, describing the arc of a much smaller circle.

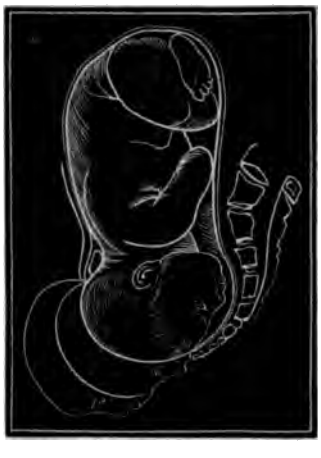
FIG. 47.



When the head arrives at the floor of the pelvis, its further progress is arrested by the perineum, sacro-sciatic ligaments, etc., etc., which form this part; but the continuation of the uterine contractions effects a movement of *rotation* from left to right, in which the occiput is passed behind the symphysis pubis, a little to its left, while the forehead rotates into the hollow of the sacrum, remaining, however, a little to the right. (*Fig.* 47.) In this situation the occipito-mental diameter of the head is almost parallel with the axis of the inferior strait, and the sagittal suture nearly coincides with the antero-posterior diameter of this strait. As the resistance at the floor of the pelvis is gradually overcome, the occiput continues to descend, passing under the arch of the pubis until the neck comes in contact with it, when its further advance is arrested. At the period when the occiput is engaged at the pubic arch, the shoulders and upper part of the body engage in the superior strait with their long diameters in the same direction as was taken by the biparietal diameter of the head, viz: its right oblique diameter.

The neck being immovably fixed against the pubis, the contractile efforts being always in a line with the axis of the superior strait, are directed upon the chin, or that portion of the head which lies in the concavity of the sacrum; the chin gradually departs from the chest, while the occiput ascends, forming the motion of *extension*. (*Fig.* 48.) During this extension, with the neck fixed against the symphysis pubis as a pivot for the head to turn upon, the forehead and face pass over the curves of the sacrum, coccyx, and perineum, and as the head emerges, the vulva becomes distended, the labia majora are effaced, the nymphæ are pressed up, the perineum becomes thin, yielding, and distended, and the sagittal suture, anterior fontanelle, forehead, nose, mouth, and chin, appear in succession at the vulva, and the head is born. It must be remarked here, that although the fetal head is impelled toward the outlet during each pain, yet its remission is followed by a recession of the head; and this may frequently be observed when the occiput, which has appeared at the vulva during a pain, recedes within the cavity during its cessation, having the labia closed over it. This recession is of immense benefit to the woman, as the distension of the parts is thereby relieved. Were the head to be forced onward without any such relief, the circulation in the parts would be obstructed, the vessels would be more or less strangulated, and inflammation, followed by gangrene, would be very apt to ensue. From a similar cause, it is

Fig. 48.

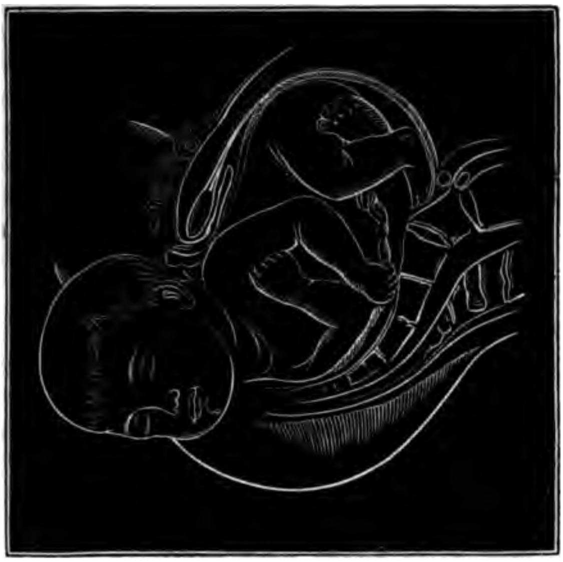


likewise advantageous to the fetus, an undue and constant pressure upon the head of which, would be likely to cause its death.

The passage of the fetal head through the pelvic cavity is often accompanied with cramps in the inferior extremities, which do not, however, interfere with the action of the uterus or the progress of the labor, but are sometimes so agonizingly painful as to demand a hastening of the delivery with the forceps: the cramps are owing to the compression of the internal sacral nerves by the head.

A few seconds after the delivery of the head, it undergoes another motion, called *restitution*, in which it becomes directed as it was previous to rotation, that is, with the face looking toward the internal posterior surface of the right thigh of the mother, and the occiput toward her left groin. (*Fig.* 49.) From a supposition that the rotation was effected without any participation of the body therein, merely occasioning a twisting of the neck, and that after the birth of the head, the neck untwisted, restoring the head to its natural relations with the body, the term restitution was applied to this last motion. But, according to Gerdy, this view is erroneous, for the trunk does rotate with the head in such a manner as to bring the long diameter of the shoulders, which was at first in the direction of the right oblique diameter, to nearly correspond with the transverse diameter of the pelvic cavity. They descend and reach the floor of the pelvis in this transverse position, which presents their bis-acromial diameter to the small, or bis-ischiatic diameter of the inferior strait, rendering it almost, if not quite impossible for them to be delivered. Consequently, the resistance offered to their further advancement, at this point, by the uterine contractions, as was the case with the head, establishes a rotation, which causes the right shoulder to pass from the right side toward the pubic arch, while the

Fig. 49.



left passes into the concavity of the sacrum, and the bis-acromial becomes nearly coincident with the antero-posterior diameter of the inferior strait, and it is this rotation of the shoulders which causes the motion of the head called restitution; it necessarily following the impulse impressed on the shoulders.

Sometimes, however, the head executes a motion, a short time previous to its *restitution*, and which occurs immediately after its expulsion. This appears to be owing to a slightly oblique position of the shoulders, while the occiput is about passing under the pubes in an antero-posterior direction, which imparts a slight twist to the child's neck, and from which it is relieved, as soon as the head is delivered, and free from the soft parts.

Shortly after the expulsion of the head, the shoulders having executed the motions above named, the right shoulder appears at the vulva and is fixed against the pubes, while the posterior or left shoulder traverses the perineal cavity in the same manner as the face in the delivery of the head, and after its disengagement at the anterior commissure of the perineum, the right or sub-pubic shoulder follows. During the birth of the shoulders, the trunk of the child becomes curved laterally, so as to correspond with the curvature of the pelvic excavation; the concavity being on its right side, and the convexity on its left.

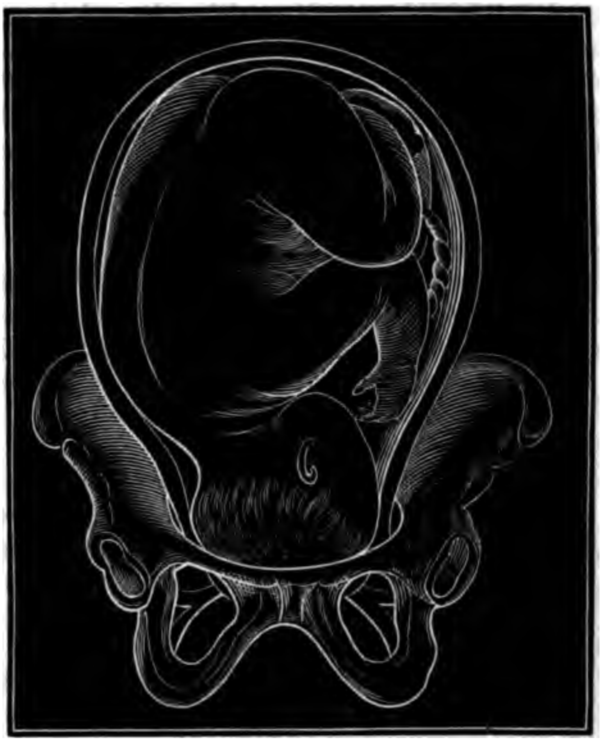
Frequently, the right shoulder will be the first delivered, or both shoulders may emerge from the vulva at the same time. After the delivery of the shoulders, the remainder of the body is easily expelled, describing in its passage, a more or less marked spiral movement.

Thus then, in a natural labor, with an occipito-anterior position, we have the head to offer its smallest diameters and circumference to those of the pelvis, and to perform the motions of flexion, descent, rotation, extension, and restitution.

2d. RIGHT OCCIPITO-ANTERIOR POSITION.

DIAGNOSIS.—In this position, the finger will first come in contact with the left parietal protuberance, and the posterior fontanelle will be found corresponding to the right acetabulum; from this fontanelle may be traced the sagittal suture, running obliquely across the pelvis from below upward, and from before backward, and from right to left, until it meets the anterior fontanelle, which will be toward the left sacro-iliac symphysis. The back of the child will be toward the front and ht of the mother's abdomen, while its abdomen will be toward her k and left; its left shoulder will be in front and to the left, and its ıt, back and to the right. (*Fig.* 50.)

Fig. 50.



Madame Boivin records 3,682 instances of this position in 20,517 cases, or about 1 in 5$\frac{4}{7}$ cases. Nægèle states that though more cases are terminated in this position, yet that its frequency as an original one is .07 per cent. Between this and the previous position there will be found but little difference in practice. Dewees states that on account of the right lateral obliquity of the uterus prevailing so often, and the rectum being occasionally impacted with hardened feces, this position is less favorable than the first; but, he adds, we may control the obliquity by placing the woman upon her left side, and can empty the rectum by an injection.

MECHANISM.—In the right occipito-anterior position, the occipito-frontal diameter of the fetal head is parallel to the right oblique diameter of the superior strait, and the biparietal of the former coincides with the left oblique of the latter; but, as in the first position, when the membranes rupture and the head descends, the occipito-bregmatic diameter of the head takes the place of the occipito-frontal, the biparietal remaining unaltered. The flexion, descent, rotation, extension, and restitution are the same as in the previous position, with the exception that rotation takes place from right to left, and restitution directs the face toward the internal posterior surface of the left maternal thigh, and the occiput toward the right groin. The delivery of the shoulders is likewise the counterpart of the first position.

3d. OCCIPITO-PUBAL POSITION.

DIAGNOSIS.—In this position the occiput, or posterior fontanelle, will be detected behind the symphysis pubis, and the sagittal suture may be traced, running parallel to the antero-posterior diameter of the pelvis, from before backward and upward, until it meets the anterior fontanelle, which will be toward the sacrum. The back of the child will face the mother's abdomen, while its abdomen will be toward her back; its right shoulder will be toward her right side, and its left toward her left.

This position occurs but very rarely, though Nægèle considers it to be the original one in all occipito-anterior positions, these being merely secondary transformations of it, and recognized only because the examination is made at too advanced a period. Baudelocque met with it twice in 10,329 cases; Madame Boivin 6 times in 20,517; and Madame La Chapelle, not once in 30,000.

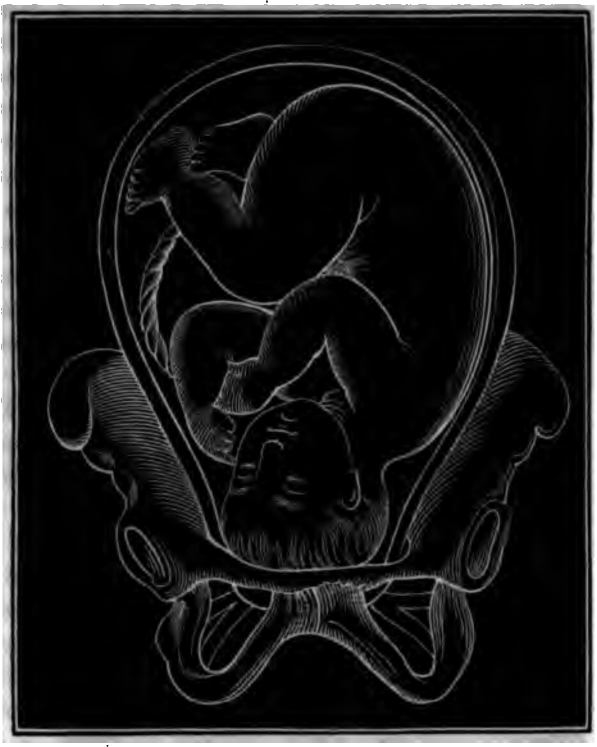
MECHANISM.—In the occipito-pubal position, the occipito-bregmatic diameter of the fetal head corresponds with the antero-posterior pelvic diameter, and its biparietal with the pelvic transverse. The mechanism differs from the two preceding positions, in the head executing only the motions of flexion, descent, and extension; as rotation is unnecessary, and the direction of restitution will depend entirely upon which shoulder engages at the pubic arch, as rotation of the shoulders must ensue, before they can be delivered. The labor, if not interfered with by any uterine obliquity which will remove the head from the center of the pelvis, will be as favorable as in either of the preceding cases.

Labor may be facilitated, when the head is in this position, making but little advance, by changing it to one of the occipito-anterior positions, especially when the vertex is high up, and manifests no disposition to assume one of these positions after the occurrence of three or four pains. To effect this change, the head may be grasped between the thumb and fingers, and the face inclined laterally; but the operation must not be attempted until the os uteri is well dilated, the soft parts yielding, and the head at the superior strait, not impacted, but free and movable, and during the absence of pain. If the change cannot be effected, we must then wait until symptoms present themselves indicating the necessity of interference by forceps or otherwise.

4th. LEFT OCCIPITO-POSTERIOR POSITION.

DIAGNOSIS.—In this position the occiput is placed at the left sacro-iliac symphysis, and the forehead at the right acetabulum. The anterior fontanelle will be found behind the right acetabulum, from which the sagittal suture may be traced running obliquely across the pelvis, from before backward, and from above downward, and from right to left, until it meets with the posterior fontanelle, which will be toward the left sacro-iliac symphysis. The back of the child will be toward the back of the mother and to the left, while its abdomen will be toward her abdomen, and to the right; its right shoulder will be toward her abdomen and to the left, and its left to her back and right. (*Fig.* 51.)

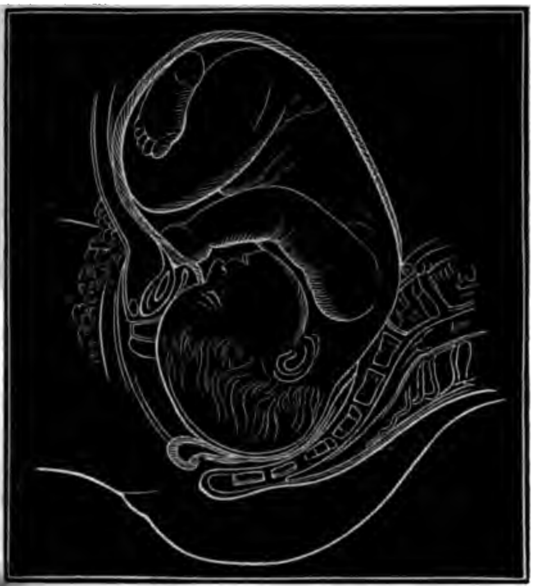
Fig. 51.



This position is very rare, occurring, according to Naegèle, in the ratio of .08 per cent.; to La Chapelle of .04 per cent., and to Boivin of .05 per cent. It is more unfavorable than the right occipito-posterior position, the labor being more painful and protracted; this arises from causes similar to those named under the second position, and may be remedied to a certain extent, by the same means as therein mentioned.

MECHANISM.—If the examination per vaginam be made at an early period, before the head has undergone much flexion, the occipito-frontal diameter will be found to coincide with the right oblique pelvic diameter, and the biparietal with the left oblique. With the descent of the head, the same as in the previous positions, flexion takes place, which changes the situation of the head, so as to bring the occipito-bregmatic diameter in correspondence with the right oblique diameter of the pelvis; and the occipito-mental diameter of the head runs nearly parallel with the axis of the superior strait. At first the anterior fontanelle will be found in the center of the pelvis, but as the head becomes flexed and descends, it rises, while the posterior fontanelle, previously beyond the touch, descends, and engages in the pelvic cavity. The descent occurs in the same manner as already described in the preceding instances. When the head has reached the floor of the pelvis, rotation, which is much more extended than in the occipito-anterior positions, takes place, the occiput describes an arc from left to right, and is carried round to the symphysis pubis, when the head is delivered in the same manner as if it had been an original anterior position. This extensive rotation could not be effected with safety to the child, unless the body participated in the motion, and which must of course require a long time to accomplish; but when completed, the labor proceeds favorably, the right shoulder is soon brought under the pubic arch, and the left passed into the sacral concavity, and the delivery is terminated as usual. The movement of restitution places the face of the child toward the internal part of the right maternal thigh, and its occiput toward the internal part of the left thigh. It is often the case in this position, and especially in primiparous women, that nature becoming exhausted, artificial assistance is demanded.

Fig. 52.



The above method is the one in which delivery is most commonly effected in the posterior occipital positions, but occasionally it occurs in another way. When the head arrives at the floor of the pelvis, the rotation places the forehead under the symphysis pubis, and the occiput in the hollow of the sacrum. (*Fig.* 52.) In this position the face of the child will be to the front of its mother, and its back to her sacrum; the occipito-frontal diameter of its head will coincide with e pelvic antero-posterior, and the biparietal will be transverse, as ell as the bis-acromial.

In this position, the uterine contractions still further increase the flexion of the head, the occiput is forced to gradually traverse the sacral, coccygeal, and perineal curve, the perineum becomes greatly distended and elongated, the occiput passes over the posterior commissure, and the head passes out by its occipito-frontal diameter. As the occiput is passing outward, the forehead rises behind the symphysis pubis, thus giving more space for the head to pass through. Sometimes, after the delivery of the occiput, the neck becomes fixed against the perineum, and the forehead, face, and chin of the child, successively emerge from under the pubic arch. Should the forehead descend so low that the eyebrows may be felt, it will, by presenting an impediment to its elevation behind the pubic symphysis at the time of the passage of the occiput over the perineal curve, very much increase the difficulty of the labor.

Dr. Dewees states, "We almost always have it in our power to reduce both this and the fifth" (when they occur with the occiput in the hollow of the sacrum, as just described), "one to the second, and the other to the first, and we should always do so when nature does not do it for us. Nor is this change of position of the head an operation of the slightest difficulty to the accoucheur; neither does it cause the smallest pain to the patient, provided, advantage be taken of the proper conditions of the uterus, and head of the child, and state of the labor. For the uterus must be well dilated, the membranes ruptured, the head occupying the lower strait, and the labor active. When these prerequisites obtain, the point of the fore-finger must be placed against the edge of the sagittal suture either before or behind the anterior fontanelle; and in the absence of pain, this part must be pressed toward the left sacro-iliac symphysis,° and maintained there during the subsequent contraction of the uterus. Should this attempt fail in changing the position of the head, by bringing the posterior fontanelle to the right acetabulum, the attempt must be repeated again and again until it succeed; which it will almost constantly do."

The expulsion of the head in the occipital posterior positions, may, in consequence of a premature extension, fix the occiput in the hollow of the sacrum, and thus the face be forced downward by the contractions, delivery occurring as in face presentations; but, in order to effect such a change in the pelvic cavity, the natural size of the head must be considerably reduced, or the diameters of the excavation must be very large.

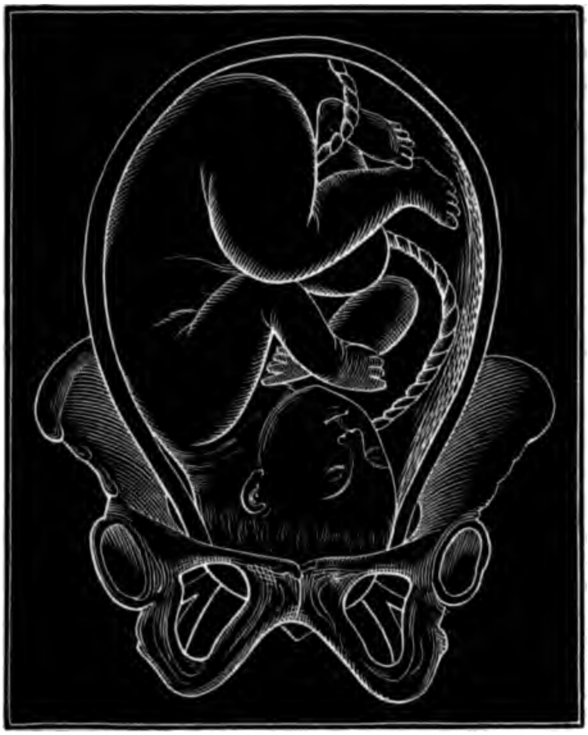
° In the fourth position of the vertex, while attempting the above reduction, the forehead must be pushed toward the right sacro-iliac symphysis, which will reduce it to the first position; in the fifth position, the pressure must be made in the direction toward the left sacro-iliac symphysis, which will place the head in the second position.—Author.

In all the occipito-posterior positions, there may be a failure of complete rotation, a want of energy of uterine contraction, or exhaustion, etc., either of which will require the interference of art.

5th. RIGHT OCCIPITO-POSTERIOR POSITION.

DIAGNOSIS.—In this position the occiput is placed at the right sacro-iliac symphysis, and the forehead at the left acetabulum, the anterior fontanelle will be found behind the left acetabulum, from which the sagittal suture may be traced running obliquely across the pelvis, from in front backward, and from above downward, and from left to right, until it meets with the posterior fontanelle, which will be toward the right sacro-iliac symphysis. The back of the child will be toward the back of the mother and to the right, while its abdomen will be toward her abdomen, and to the left; its right shoulder will be toward her back and to the left, and its left to her abdomen and right. (*Fig.* 53.)

FIG. 53.



This is considered the most common of the occipito-posterior positions, and is stated by Nægèle, to be the next in frequency, among the vertex presentations, to the left occipito-anterior, occurring in the ratio of 29 per cent. In 355 cases, related by Simpson, 256 were in the first position, 1 in the second, 2 in the fourth, and 76 in the fifth. Its frequency, is supposed to be owing to the same cause which [illegible] ise to the left occipito-anterior position, viz: the pressure of the [illegible] on the left side of the pelvis, which happens especially, when, as [illegible] mon to women advanced in pregnancy, there is an accumulation of hardened feces. It is a more unfavorable position than the first three, and the labor, though generally accomplished by the natural powers, is more tedious and painful, than with the occipito-anterior positions.

MECHANISM.—This is the counterpart of the fourth position, and difficulties or changes may be encountered, similar to those met with in that position. At the commencement of labor, the occipito-frontal diameter will be found to coincide with the left oblique pelvic diameter, and the biparietal with the right oblique, the two fontanelles, as in the preceding case, being at nearly the same level. As the labor advances, flexion ensues, and the occipito-bregmatic diameter takes the place of the occipito-frontal, the axis of the superior strait corresponding nearly with the occipito-mental diameter. Flexion, descent, rotation and restitution, occur as in the preceding case, with the exception, that the rotation takes place from right to left, the left shoulder is brought to the pubic arch, and restitution brings the face of the child toward the internal part of the left maternal thigh, and its occiput toward the internal part of the right thigh.

6th. OCCIPITO-SACRAL POSITION.

DIAGNOSIS.—In this position the forehead or anterior fontanelle will be detected behind the symphysis pubis, and the sagittal suture may be traced, running parallel to the antero-posterior diameter of the pelvis, from before, backward, and downward, until it meets the posterior fontanelle or occiput, which will be toward the sacrum. The back of the child will face the mother's back, while its abdomen will be toward her abdomen; its right shoulder will be toward her left side, and its left toward her right.

This position is of very rare occurrence, so much so that its existence is doubted by some accoucheurs, and, together with the third, it is not classified as a position by several authors. In 20,517 deliveries it was met with but twice.—*Boivin.*

MECHANISM.—In the occipito-sacral position, the occipito-bregmatic diameter of the fetal head corresponds with the antero-posterior pelvic diameter, and its biparietal with the pelvic transverse. The mechanism differs from the two preceding positions, in the head executing only the motions of flexion, descent, increased flexion and extension. The motion of rotation is unnecessary, and the direction of restitution will depend upon which shoulder engages at the pubic arch. If nature does not reduce this to an occipito-posterior position, and the labor is slow and painful, it may be facilitated by effecting the reduction artificially, in the same manner, and guided by the same rules, as named, when treating of the mechanism of occipito-pubal positions. The head may present in positions not exactly agreeing with those just given, relative to which, Dr. Dewees very correctly remarks: "Mathematical precision is not required in such cases, especially as the mechanism of the labor is not altered; for, when the posterior fontanelle is at all in advance of the sacro-iliac junction, either right or left, it will almost always eventually place itself under the arch of the pubes, and this is all that is necessary."

It may be proper to remark here that sometimes the movements of the head do not occur exactly in the manner just described. Flexion, for instance, will be found to occur previous to the descent of the head, or simultaneously with it, or not until the head has reached the pelvic floor; and, occasionally, extension will take place so far as to gradually place the anterior fontanelle in the center of the pelvic cavity, flexion occurring, however, as soon as the descent is completed; this last irregularity is more usual with occipito-posterior positions. Again, Dubois has met with a few cases, in which excessive flexion brought the posterior fontanelle to the center of the excavation (or perhaps, an inclination of the trunk backward, may have effected it), but which was restored to its proper situation upon meeting with the resistance from the pelvic floor.

Rotation may also vary; it may commence while the head is at the upper part of the pelvic cavity, so that flexion, descent, and rotation occur simultaneously; or it may not take place until the head has almost passed the posterior commissure of the vulva. Rotation may also be incomplete, or it may be so extensive as to carry the occiput, not only to the pubic symphysis, but even beyond it, to the acetabulum of the opposite side; in these latter instances, after a short period of rest, it again places itself behind the symphysis, by a retrograde motion. These irregularities are not easily accounted for, and though they may render the delivery tedious, yet it will generally be effected without any artificial interference.

Rotation of the shoulders likewise, offers some irregularities; it may be wanting, or it may be incomplete, or it may be excessive, the same as with the rotation of the head.

The pressure upon the circumference of the head, produces a sero-sanguineous engorgement over the part not subjected to the compression, which is always the lowest or presenting part. This tumor, *caput* *succedaneum*, may become so developed as to obscure the diagnosis, or lead to the supposition of a breech presentation; but, if the finger be carried beyond its circumference, the bony resistance of the head will determine the presentation. The diagnosis of the position, may, however, not be so readily ascertained, as this engorged condition of the scalp may prevent the detection of the fontanelles; in such cases, the delivery will require to be performed without interference, bearing in mind, that in vertex presentations, the major part are delivered by the unaided efforts of nature.

This tumor of the scalp is an unerring indicator of the position of the fetal head; thus, in the left occipito-anterior position, it will be found on the right parietal protuberance, and in the right occipito-anterior on the left; in the occipito-posterior positions, it is located about the center of the vertex, sometimes on the anterior fontanelle, but, generally, to correspond with the part originally at the os uteri, and subsequently with the part which presents under the pubic arch.

It may be distinguished from a sanguineous tumor of the head, which Nægèle has termed *cephalæmatoma*, by the following characteristics: it is irregularly circumscribed, being larger in proportion to the tediousness of the labor; is always single; is œdematous, retaining the pit of the finger; has no fluctuation; and the scalp is of a well-marked violet color. The cephalæmatoma vary in size, from a small nut to a hen's egg; it is distinctly circumscribed; possesses a well-marked fluctuation, sometimes pulsations; its center is sometimes so greatly depressed, as to be mistaken for a perforation of the bone; its base is limited by a prominent osseous border, which, however, is often not developed for several days after the commencement of the disease; and the skin covering it is colorless. Again, the caput succedaneum appears directly after birth, and disappears in from twelve to forty-eight hours, while the cephalæmatoma seldom appears until some hours after the delivery, and lasts for several weeks.—*Cazeaux.*

CHAPTER XXVIII.

ON DIFFICULT LABOR.—FIRST STAGE.

Difficult, lingering, tedious, and protracted labor, belongs to the second class, and includes all labors where the fetal head presents, but where they continue beyond twenty-four hours, and may require some medicinal, manual, or instrumental aid. It is true, that cases will be met with, in which artificial delivery may be required within the twenty-four hours, and others, again, which may continue for a period considerably beyond twenty-four hours, but these instances form exceptions to the above definition. As a general rule, however, the one given will be found exceedingly salutary and beneficial in practice, and an attention to which, will be calculated to prevent the occurrence of any mischief from a rash or premature interference of the practitioner.

The danger in a difficult labor, depends entirely upon the stage in which the delay happens; thus, the first stage of labor may continue for even sixty or seventy hours, with but little, if any danger, especially if the membranes remain entire, and there is a proper amount of liquor amnii present, and no mechanical impediment exists. But delay in the second stage, is always attended with danger, if it continues beyond a comparatively short time; hence, in estimating the necessity for interference, we are not to be governed so much by the length of time occupied by the first stage, as by the interval which has elapsed since the rupture of the membranes and the discharge of the amniotic fluid; and the experience of accoucheurs has demonstrated that the danger is, commonly, in proportion to the duration of the labor. From statistics of the Dublin Lying-in-Hospital, it appears that when labor exceeds thirty hours, one woman in thirty-four dies; when it exceeds forty hours, one in thirteen dies; beyond fifty hours, one in eleven; and beyond sixty hours, one in eight.

Difficult labors are more common among primiparæ, and are, likewise, not unfrequent among multiparæ who have given birth to a large number of children. According to the statistics of English obstetricians, 653 cases of difficult labor occurred in 23,758, or about 1 in 36; and it will frequently happen, that a practitioner in his individual private practice, may meet with even a much larger average than this.

The continuance of a labor beyond a period of twenty-four hours is necessarily calculated to arouse the fears of the patient and her friends, as to the cause of the delay; and if the practitioner does not proceed properly in such instances, the anxieties and doubts of the friends may lead them to require the aid of a second accoucheur, or perhaps the dismission of the first. It is therefore always proper, when the labor has continued thus long, to institute a careful investigation of the condition of the patient, and of all the presenting symptoms, for the purpose of learning the cause of the delay, and at once applying the remedy. "In estimating lingering labors, we calculate from the first commencement of true uterine action; but in estimating the length of labor, in reference to the patient's strength and its effects on her system, we principally take into consideration the time that has elapsed since the membranes broke; for it is reasonable to infer that no great exertion has been sustained, consequently that little or no exhaustion has appeared; and particularly, that scarce any injurious pressure can have taken place on the soft parts within the pelvis, while the membranous cyst remained entire, provided there be an ordinary quantity of liquor amnii. Thus, when called to a case of lingering labor, in considering the chance of injury from its duration, our mind should be directed, not so much to the interval which has elapsed since the first accession of uterine pains, as to the time at which the membranes ruptured; and that should be looked upon as the period when it was possible for dangerous pressure to have commenced."—*Ramsbotham.*

The management of a patient in difficult labor must be similar to that required in natural labor. She should not be kept in one position, but should be allowed to sit, walk, or lie down, as she may prefer, and more especially in the early part of labor; in the latter stage, circumstances may require her to preserve the recumbent posture. She must not bear down or make any efforts to assist the uterus during its contractions, as such efforts may cause the membranes to give way prematurely, exhaust the patient's strength uselessly, or otherwise interfere with the progress of the delivery; and this is a point which cannot be too strongly insisted upon. It is only during the second stage of labor, when the presentation and position are both favorable, that the action of the muscles of the abdomen may be exerted with advantage. The room should be kept cool and quiet, to prevent fever and induce sleep. Bland, nourishing fluids, weak tea, or acidulated draughts, may be allowed, but stimulants and solid food must be prohibited. Too frequent vaginal examinations are injurious, but the condition of the bladder should be ascertained every two or three hours, and much urine should not be allowed to collect in it. This is of especial importance in difficult labors: the urine should be passed often, either naturally or by catheter; and in the use of the latter, no force must be employed, and care must be taken not to permit it to slip into the bladder. If the metallic instrument cannot be introduced, an elastic catheter must be substituted; and although under ordinary circumstances no exposure of the female is allowable, yet there may be instances where, from the failure in introducing the above instrument, and the condition of the parts, an exposure will be necessary to accomplish the desired evacuation of the bladder. This, however, must never be practiced, except under the most imperative requirements. This class of labor may be owing to one or more of several causes, which I shall now proceed to designate and treat upon.

A very common cause of protracted labor is, INEFFICIENT ACTION OF THE UTERUS, in which the contractions are partial, feeble, or irregular: they may continue only for a few seconds, they may hardly be appreciable, or they may occur at irregular and lengthy intervals; and in each instance, the os uteri may be soft and dilatable. This cause will, in some cases, be owing to a torpid, inactive, and sluggish condition of both mind and body, or a want of proper nervous irritability in the constitution; to some depressing action, as debility resulting from excessive discharges, previous disease, etc.; to sudden and violent emotions of the mind, and other circumstances which exert an influence on the brain and nervous system. Debility of the system, or even the presence of serious disease, does not invariably occasion inertia of the uterus, for we frequently meet with females laboring under tubercular phthisis, hectic fever, etc., who pass through their labors with great facility. With some females the tendency to difficult or easy deliveries appears to be a peculiarity transmitted from parent to child, and occurs independent of any abnormal conformation, or habit of the system. A deranged condition of the digestive organs will frequently influence the character of the uterine contractions, as will likewise irritation of the os or cervix uteri.

Females are often annoyed, at the close of gestation, with false, spasmodic, or irritable pains, which have no connection whatever with the contractions in the fibers of the uterus, and which have, in some instances, given rise to the absurd statements that labor has continued uninterruptedly for one, two, or more weeks. Care should be taken to distinguish these from the proper contractions of the uterus.

Inefficient action of the uterus may occur during the first or second stage; and, as before remarked, the danger is greater in the latter than in the former instance. In the *First Stage* we may find the pains feeble or irregular, and exerting but little influence upon the bag of membranes; yet if there is only a slight increase of the pulse, "with the surface of the body cool, tongue moist, absence of thirst, no tenderness of the abdomen on pressure, no heat or tenderness of the vagina and os uteri, and dilatation is advancing, however slowly, we ought not to interfere, for many hours may elapse before this stage will be completed, and yet the pressure of the fetal head upon the soft parts will produce no evil effects if the apartment be kept cool, the posture be occasionally changed, voluntary efforts at bearing down be avoided, and nothing but mild nourishment and diluents be allowed."

TREATMENT.—When there is considerable delay in the advancement of the first stage of labor, the patient should be kept in as cheerful a condition as possible, and she may occupy the time by walking about,—but not to cause fatigue,—by reading or sewing, by frequently changing her position, etc.; and should be encouraged to exercise patience, which virtue the practitioner will find equally demanded on his part. If the bowels have not been freely evacuated, a stimulating enema or a dose of purgative medicine may be given, and which will frequently arouse the uterus to increased action. If the pulse is weak and slow, and no heat, but rather coolness of the surface, nor hemorrhage, some arrowroot, or gruel, or wine and water, may be beneficial, but their use should be permitted with caution. If, from the want of sleep, continued suffering, and anxiety of mind, the patient should become fatigued or exhausted, a soporific dose of opium or some of its preparations should be administered, or any other hypnotic; upon awakening from the influence of which, she will not only feel refreshed, but will very likely have a recurrence of the pains with increased energy. And the opiate should always be preceded by a purgative when constipation exists.

If there is a plethoric condition of the uterus, or an irritated state of the os and cervix uteri, this may be frequently overcome by the use of diuretics and diaphoretics; and as a diuretic, in these instances, I prefer an infusion of the Cleavers (*Galium aparine*), or of the Hair-cap Moss (*Polytrichum juniperum*), with the compound powder of Ipecacuanha and Opium as the diaphoretic. Plethora of the uterine tissue may be known by the energy with which the pains are at first manifested, but which soon diminish in frequency and intensity. The cervix is soft and yielding, but the presenting part does not engage during the pain; the pulse is hard and full, the respiration laborious, and the pains are equally diffused over the whole abdomen.

Sometimes the employment of warm diluent drinks, as of tansy, pennyroyal, etc., with frictions over the abdomen, will frequently succeed in restoring or increasing the contractions, without other aid being required.

When the pains occur at very irregular periods, are confined to the uterus, and do not render the bag of waters tense, nor impart any hardness to the uterus when felt through the abdominal parietes, the pulse being quick and full, and the uterus unusually developed, the inertia is owing to an *Excess of Liquor Amnii*, over-distending the organ, or perhaps the presence of *Twins*. In this case, although the soft parts are relaxed and dilated or dilatable, the labor does not progress any, the uterus being, from this cause, rendered incapable of contracting sufficiently powerful to rupture the membranes, and the patient becomes fretful and restless. The only remedy in this case, is a discharge of the liquor amnii by an artificial rupture of the membranes, which should be done during the absence of pain, and made as high up as possible, in order to avoid a falling or washing down of the cord; though I would especially desire to impress it upon the mind of the student, that this procedure is entirely unjustifiable in ordinary labors, and must not be attempted unless it is well ascertained that there is no mechanical impediment, that the head presents, and the os uteri is dilatable. A premature rupture of the membranes, by discharging the bag of waters and bringing the hard and unyielding head of the child upon the sensitive os uteri, may delay the labor by lessening the pains, or producing rigidity of the os. Still-born children are more frequently the results of too early rupture of the membranes, and, probably, the use of instruments are likewise oftener required in such cases.

If the relaxation or cessation of uterine contractions depends upon moral influences, the attendant, by ascertaining the trouble, may perhaps, by a prudent and sagacious course, remove them; but if this is impossible, he will be governed by the effects produced, using stimulants in case of depression, and sedatives where much nervous excitement exists; and in these latter instances the induction of sleep will frequently be followed by uterine efforts.

I am decidedly opposed to the use of ergot during the first stage of labor, where the only difficulty is the inefficiency of the uterine contractions, for, as a general rule, an attention to the various symptoms which may present themselves, during this stage, with their appropriate treatment, will be all that is demanded. But, should circumstances require the use of agents which exert a parturient influence upon the uterus, the infusions of the bark of the Cotton root, or Black Cohosh root, or Blue Cohosh root will prove, as a general rule, more salutary than the Ergot; these infusions should be used warm, and in doses of from two to four fluidounces every half hour or hour. Of the latter articles, their concentrated preparations, Cimicifugin, or Caulophyllin, in doses of from one to three grains, given as above, will be found equally beneficial. Occasionally, females will be met with, upon whose uterine system these agents produce but little, if any influence, and in whom, under imperious circumstances it may become necessary to administer ergot, but I shall have occasion to refer to these cases hereafter as well as to others in which ergot may be employed. Usually, however, the remedies above noticed, both during the first and second stages of labor, will prove fully as efficacious as ergot, without any of its injurious tendencies.

RHEUMATISM OF THE UTERUS may be present during the non-gravid condition of the organ, at an early period of gestation, and at the time of labor during either of its stages. It is produced by the same causes that favor the development of rheumatism in other parts, as exposures to cold and moisture, insufficient clothing, sudden changes of temperature, especially from a high to a low one, and, occasionally, from a rheumatic metastasis; females constitutionally disposed to rheumatism are more liable to it, though it frequently exists without any other part of the system being affected by it.

"The most prominent symptom of this disease is pain, or a distressing sensation, without any appreciable cause, and which may involve the whole or only a portion of the uterus. The intensity of the pain is variable, and the whole organ may suffer from it, or only a part, as the fundus, corpus, or cervix. The location of the pain depends upon the portion of the organ which is affected; thus if it be seated in the fundus, the sub-umbilical region will suffer the most; if in the inferior portion of the uterus, acute dragging sensations will be experienced extending from the loins to the groins, thighs, and external genital organs. Pressure upon the organ augments the pain, and if the inferior part of the womb be affected, much suffering will be caused by pressure upon the cervix during a vaginal examination. Frequently the contractions of the abdominal muscles, or even the weight of the bedclothes, will increase the pain. The pains, as with all rheumatic affections, frequently metastasize, and pass from one point of the organ to another, or to some other organ, and not unfrequently, disappear, suddenly. Remissions occur sometimes, during which, a sensation of weight in the part is experienced. Recto-vesical tenesmus almost always accompanies the pain, and the evacuation of urine is attended with considerable smarting and acute pain, and at other times the evacuation of both the bladder and rectum is impossible. The pain is usually attended with febrile symptoms, but sometimes these are absent. A repetition of the attacks of pain is very apt to occasion uterine contractions, which may determine an abortion.

"When rheumatism of the uterus occurs during labor, it generally impedes the progress of the labor, and sometimes, even prevents the spontaneous expulsion of the child. Normal contractions of the uterus only begin to be painful, when it has accomplished the greater part of its task, and is in the act of distending and dilating the os uteri; or in other words, true labor-pains begin only at the instant when the energy of the corpus uteri overcomes the resistance of the cervix. While in rheumatism of the uterus, the contraction is painful from the first, and before any influence is exerted on the cervix; so that the cause of the pain is not in the violent distension of the os uteri, but in the contraction itself, in the other morbid conditions, and in the altered relations of the nerves and contractile fibers of the uterus.

"Again, in a natural labor, the contractions commence at the fundus, and are directed toward, and terminate at the cervix. In rheumatism, instead of commencing at the fundus, they begin at the painful part, and run toward the cervix in an irregular manner. The rheumatic pains also exist before the uterine contractions, and under the influence of the latter, they rapidly acquire a high degree of intensity; and sometimes their violence arrests the contractions before they have traversed their ordinary cycle, in which case they are rapid, short, and grow less and less frequent.

"Toward the close of the labor, when the action of the uterus requires to be aided by the voluntary contraction of the abdominal muscles, the female, for fear of augmenting her sufferings, refrains from contracting these muscles, thereby causing the labor to be excessively slow. She is in a state of extreme anxiety, with an increase of the frequent pulse, the hot skin, the thirst, and urinary tenesmus. When these sufferings are much prolonged, she falls into a state of swooning, which frequently proves serviceable, as the pains are suspended while it lasts; under these circumstances a profuse perspiration has been observed, which has had a most salutary influence on the rest of the labor. But, in other instances, the uterus becomes more and more painful; it is rather in a state of permanent contraction, or fibrillar vibration, than of normal contraction; the pulse being accelerated, and the woman threatened with a metritis, which renders the labor extremely painful."—*Cazeaux.*

Uterine rheumatism is frequently mistaken for acute inflammation of the womb, and as the symptoms resemble each other very much, it is very difficult to discriminate between them. Rheumatism attacks mostly very nervous and susceptible women, and may be more readily suspected when the patient has had previous attacks of rheumatism or neuralgia, in other parts. Cazeaux determined the disease by touching; thus, rheumatism and inflammation of the uterus are both painful; but in rheumatism, although the first touch of the womb is painful and quick, yet upon gently and slowly raising it upward with the index and middle finger, the pain either ceases altogether, or is much mitigated, by removing the tenesmus uteri; while in inflammation the touch becomes more painful the more it is prolonged. [illegible]

TREATMENT.—The means which may be adopted [illegible] these cases, are various. In the first place the bow-been previously evacuated, must be emptied by an injection ; if the pain be not very severe, but troublesome and annoying, the compound powder of Ipecacuanha and Opium, may be given in doses of five or ten grains, and repeated every half hour or hour; or the compound tincture of Virginia Snakeroot, may be used as a substitute for this powder, in doses of one or two fluidrachms. If there are marked remissions, the compound powder of Quinia may be given in doses of three or six grains, and also repeated every half hour or hour. Fomentations of Stramonium leaves, or other narcotics, may also be advantageously applied over the abdomen, and when the pain is very severe, much benefit will be derived from the application of dry cups over the lateral inferior portions of the sacrum. Should the disease manifest itself soon after the sudden disappearance of a rheumatic pain in some other part, revulsives or counter-irritants should be placed over the part primarily affected, for the purpose of recalling the pain, if possible, to that part.

Other means may likewise be used, with equal, if not greater advantages, in some cases, than those just named; for instance, the tincture of Gelseminum may be exhibited in one or two fluidrachm doses, and repeated according to circumstances; or it may be combined with one-third or one-half its quantity of tincture of Black Cohosh, or tincture of Lobelia, or tincture of Aconite root. The compound tincture of Lobelia and Capsicum, will most generally give prompt relief, if exhibited in large doses, as from two to four fluidrachms, with rectal injections of the same tincture slightly diluted.

The disposition to uterine rheumatism at the period of labor, may, in most instances, be entirely overcome by the use of the compound syrup of Partridgeberry during gestation. General venesection, although it may afford relief, is never necessary, as its results are ultimately more disastrous to the patient than beneficial, and a more permanent advantage is gained over the disease by the above course, than could possibly be effected by the employment of the lancet; and by pursuing it, there will exist but little necessity for forceps, unless other symptoms, not immediately connected with the rheumatic attack, are present.

RIGIDITY OF THE OS UTERI, during the first stage of labor, is a frequent cause of its protractedness. This may occur in any case, but is more frequently met with in primiparæ, in females of an advanced age, and in instances where the membranes are prematurely ruptured. It may be occasioned by repeated and unnecessary examinations, the use of stimulants, mea [illegible] nstipation, or retained urine. It may also be owi [illegible] seased condition of the os itself, either natural, or effected by the improper use of pessaries or other mechanical aids to support the uterus, as well as the imprudent application of escharotics to the os, for the removal of some real or imaginary affection.

Rigidity of the os uteri may be suspected in cases where the head presents and the pains are regular and normal, but dilatation proceeds very slowly, if at all; in addition to which, Madame La Chapelle refers to another symptom, viz: pains in the loins. On examination, the os uteri will be found thin, resisting, hot, dry, and painful to the touch, or, soft, œdematous, semi-pulpy, and undilatable, and which must be carefully distinguished from the soft and flabby condition into which the thin and rigid cervix must pass before it will dilate. Sometimes the rigidity is excessive, the os being unusually dense, feeling like cartilage, with a stubbornly unyielding edge; or if this be thin, the same resistance will be met with, and a sensation is conveyed to the touch, similar to that produced by a hole made in thin, extended parchment.

Very frequently the rigidity will not be confined to the os uteri, but will extend into the vagina and soft parts; they will be found hot, dry, swollen, and extremely sensitive to the touch, and if this condition be not overcome, the patient becomes restless and feverish, the pulse rises to 100 or 110, and finally, exhaustion of the vital forces manifests itself. Occasionally the os uteri will be found to contract during a pain, remaining rigid in the interval; and in such instances a rupture of the uterus may occur. Instances are recorded in which the rigidity was so obstinate that the os uteri has been torn off and expelled in the form of a ring.

TREATMENT.—Among many writers, venesection, *ad deliquium animi*, is considered the most successful and potent remedy in this difficulty, and is the one on which the utmost reliance is placed by the major part of the profession. I admit that bleeding will overcome rigidity of the os uteri, as a general rule, but then I by no means admit it to be a proper or safe remedy. A female in labor requires all the strength natural to her system, not only to sustain her during its progress, but also to enable her to withstand and quickly recover from the nervous shock. By the loss of an amount of blood sufficient to cause syncope, a debility of the nervous and circulatory systems must ensue, producing a condition unfavorable to either of these requirements; and I have frequently witnessed a tedious second stage, with subsequent hemorrhage or other evils, following a bleeding practiced in the first stage, and which I had every reason to believe were augmented, if not actually produced by the venesection. Debility of the system, and more especially when sudden, persistent, and at the period of parturition, is incompatible with a safe or energetic labor. Beside the weakening influence of venesection upon the constitution, we have an increased prostration of nervous and muscular force, produced by the shock imparted to the brain and nervous system, as well as by the loss of blood which necessarily follows the birth of every child. Indeed, it is impossible for any practitioner to determine what amount of blood may be lost from the labor itself, independent of any artificial discharge; and who can tell, how many precious lives have been lost from uterine hemorrhage, or other fatal symptom, in the practice of believers in this treatment, which might have been preserved had the lancet been cast aside? Indeed, so well are the adherents of this practice satisfied of its danger to the parturient woman, that they especially caution us not to resort to it, until the parts become swollen and tender, the pulse increased, with febrile symptoms, or a tendency to cerebral congestion; and even then we are advised to use it with care. The injurious tendencies of bleeding do not cease with the completion of delivery, for whether it be artificially effected by the lancet, or naturally by uterine hemorrhage, not only is the puerperal month one of slow, tedious convalescence, if this term can justly be applied to it, but very frequently, a lifetime of irremediable suffering and disease is the inevitable consequence.

In the treatment of this difficulty, *we* have no occasion to wait for the appearance of the above symptoms before attempting relief, because we have means to subdue it without the infliction of any immediate or permanent injury to the system, and as soon as the evil manifests itself, we at once apply the remedy, saving the patient a great amount of suffering, and the friends and ourselves much anxiety and alarm. And hence, we believe our practice has a vast advantage over that which dare not attempt *certain* relief until after a lengthened period of pain and distress, and when exhaustion of the vital forces is about to commence. Promptness in combating this symptom, as well as many others, is the only method by which to ensure certainty of success.

In cases of rigidity, during the early part of labor, it will be necessary to evacuate the contents of the rectum as well as of the bladder; if, after having waited for ten or fifteen minutes subsequently, the rigidity still remains, it may readily be overcome by one of the following means: The compound tincture of Lobelia and Capsicum may be given in a dose of one, two, or four fluidrachms, according to the urgency of the case, and repeated in ten or fifteen minutes should it be required, and in the generality of cases, this will effect a speedy and safe relaxation. I have sometimes met with cases, in which it became necessary to administer, in conjunction with the above, an injection of the same tincture, employing it in the quantity of half a fluidrachm, or a fluidrachm diluted with a similar amount of water, and requesting the patient to retain it as long as possible. Indeed, in many instances, this enema will be found sufficient to overcome the rigidity, without the administration of any medicine by mouth; and in a few instances, where rigidity had existed for a long time, and was rather intractable, I have subdued it, by aiding the above conjoined means with fomentations of Stramonium leaves applied over the abdomen and genital parts. In the first stage of labor, this fomentation may be employed with safety. Lobelia, or some of its compounds, has been used by various practitioners in a manner similar to the above, and with almost universal success. The emetic influence of this agent, in whatever combination it may be given, is not necessary to produce the required result, nor indeed is it always desirable that emesis should follow; much more salutary and immediate results will ensue from nauseating and relaxing doses—and when vomiting has once occurred from its use, without relaxation, it will frequently be found, that smaller doses will not be retained sufficiently long upon the stomach to exert any relaxing influence. Lobelia has been combined with some preparation of Opium, and administered by mouth and in enema, with success by several physicians, but I have never employed it in this form, although I have no doubt of its efficacy.

The tincture of Gelseminum has, within the last few years, been recommended to overcome this difficulty, and I have administered it in a considerable number of cases with benefit. It possesses an advantage over Lobelia, in not causing nausea or vomiting; but, as a general rule, its influence is not so readily experienced as with that drug, and when once effected, it is of a more permanent character. Some cases will be met with, however, whose susceptibility to its action is so great, that half a fluidrachm will produce powerful relaxation, while others again, may take several fluidrachms with but little effect; these latter instances are found only occasionally, but sufficiently often for the practitioner to keep the fact constantly before him. The dose of the tincture is from half a fluidrachm to a fluidrachm, which may be repeated every fifteen or thirty minutes, according to the peculiar nature and urgency of the case. An overdose will not produce any evil effects, further than an increase of relaxation and its greater persistency, unless the remedy be improperly continued after a full manifestation of its influence; the antidotes to its overaction are stimulants internally, aqua ammonia to the nostrils, and, if required, electro-magnetism.

I would call the attention of the profession here, to an important point connected with this agent, and which is not named in my Dispensatory, from not knowing the fact, when this was published. The tincture should always be prepared from the fresh root, and kept in well stopped vessels; if made from the dried root, it is useless, and even when properly prepared, if the vessels containing it, are kept open, it loses a volatile principle, upon which its power, probably, depends, and becomes inert. I have seen specimens, which, if given in half-pint doses, would, I believe, produce no other effect upon the system, than that caused by the liquor alone.

In addition to the above-named means for overcoming its relaxing influence, it may be stated that, a piece of Turk's Island salt, (common coarse salt,) about the size of a large pea, chewed and swallowed, will produce a restoration in five or ten minutes, in many instances. Dr. F. D. Hill informs me, that at one time, his brother brought from Vicksburg, on the steamer General Pierce, five barrels of the tincture. They were common whisky barrels, and were placed in the hold, easy of access. Knowing the disposition of the deck hands to tap such barrels, he informed the mate, that the contents of these were of such a nature, that he must not allow the hands to drink it. Notwithstanding this caution, the barrels were tapped, and the tincture drank for whisky, and all who partook, were more or less affected by it. But of three men who had partaken freely, having swallowed about a pint each, two died; when the doctor's brother heard of the circumstances, he immediately prescribed for the other, and saved him by the employment of quinia and capsicum in large doses, aided by external stimulation.

In those cases where inflammation of the os uteri is caused by unequal pressure of the child's head upon it, the Gelseminum will be found a valuable remedy.

The induction of copious perspiration by the spirit vapor-bath, or otherwise, has been advised, and will, probably, be found effectual in some cases. But, on account of the trouble attending its application during parturition, and the danger of chill subsequently, it is better to employ it only when imperatively required.

Inhalation of Chloroform, the direct application of extract of Belladonna to the os uteri, artificial dilatation, etc., have all been recommended by various writers, but I have never used them; the above means having proved successful in my own practice, as well as in that of others presented to my notice.[*]

---

[*] In relation to manual dilatation of the os uteri, which has been recommended by some writers, under certain circumstances, it may be well for the student to acquaint himself with the following rules, given by Prof. Dewees, which may prove serviceable in the cases to which he alludes:

To overcome Rigidity of the Vagina and soft parts, it may become necessary to employ vaginal injections, or to apply fomentations to the perineum. A warm infusion of equal parts of Elm Bark and Lobelia

---

"1st. When this part does not coincide with the direction of the uterine forces, and the axis of the vagina. In this case, labor may become very tedious, for the want of a correspondence of axes; I therefore attempt to establish them, as directed in cases of obliquity of the uterus.

"But I never attempt even the slight change here spoken of, until the os uteri is yielding, and at the same time dilated, to the size of a dollar, and the pains in pretty full force. By this method, not the slightest violence is committed, nor is even pain excited.

"2d. When the pains are powerfully protrusive, and the os uteri, though pretty amply dilated, yet not sufficiently so to permit the parietal protuberances to pass freely through it. In this case, much time and suffering are very often saved, by running the extremity of the finger round the margin of the os uteri, and gently stretching it. For in many instances, if we gain an increase of half an inch in the diameter of this part, it is all that is required, to enable the head to pass it.

"3d. When the head is detained by the anterior portion of the uterus being in advance of it, and holding it as it were, in a sling. In this case, that portion of the neck of the uterus, which is placed before the head, is obliged to sustain the whole force of the uterine efforts; in consequence of which, it becomes not only severely stretched, but it very effectually opposes the advancement of the presenting part, and gives rise to much unnecessary delay, as well as very much augmenting the sufferings of the patient.

"This case is one of very frequent occurrence; and women who have ample pelves, and especially those who have had several children, and are liable to the anterior obliquity of the uterus, are more particularly obnoxious to it. I do not know that any writer has noticed this cause of tedious labor; and though this can not, strictly speaking, be considered as an instance of rigidity, it nevertheless has all the effects of that condition, as it creates delay, by a portion of one of the soft parts opposing the passage of the head; and may, therefore, with much propriety, be considered under the present head of our subject.

"We are every way satisfied, from long observation, that this situation of the uterus, and of the head of the child, is one of the most common causes of delay when everything else is favorably disposed, that occurs in practice—at least in this country. Whether this be so in Europe, where the remote causes, namely, large pelves, are not so general, we are unprepared to say; but we are certain, that the frequency of this relation of the head of the child, and the anterior portion of the uterus, in this country, render such labors more tedious, by hours, than they would be, if no such interposition of the neck of the uterus took place.

"It is true, that the remora which the neck of the uterus offers to the passage of the head when down before it, never of itself creates a serious difficulty; the evil chiefly consists in a painful and an unnecessary delay; but as the case is always manageable, when it is proper to offer aid, it is certainly right to correct this deviation from a strictly healthy labor, as early as circumstances will permit.

"The proper time to act is, when the head occupies the inferior strait and vagina, completely; when the pains are active; and when the os uteri is sufficiently dilated to permit the head to pass, if the axis of the head, and that of the os uteri, were coincident.

"To relieve the head from this state of embarrassment, we must draw the prolapsed edge of the os uteri by the point of the finger, in the absence of pain, toward the symphysis pubis, and maintain it there, until a pain comes on. At this moment, the point of the finger is to be placed against the edge of the uterus, which is to be pushed upward may be used in enema; and the same articles may be used as a cataplasm or fomentation. These, however, will not always be required, as the means above recommended will generally overcome the rigidity of

---

between the head of the child and the pubes. Should we be able to carry the prolapsed portion of the uterus above the advancing portion of the head, the former will suddenly withdraw itself from the finger; the vertex will apply itself to the arch of the pubes, and the labor terminate almost immediately.

"It sometimes, however, requires several trials of this kind before they may succeed; but the attempt must not be abandoned because it fails a few times, for the principle is a correct one, and should be acted upon perseveringly, should perseverance be necessary. We have everything to gain, if we succeed, and nothing to lose if it fail; a disappointment, by-the-by, which can not well happen, if the process for the restoration of the prolapsed part be properly conducted.

"We are convinced that we have seen very many labors, shortened by hours, by acting as just proposed for such cases. It would be extremely difficult to determine, *à priori*, the duration of a labor of this kind, if left to itself; as the resistance which the margin of the uterus offers to the head, will for a long time be more than equal to the power of the uterine forces; consequently, the labor becomes stationary, and will continue to be so, until the margin of the uterus is obliged to yield, by its losing a part of its power from attenuation, or perhaps by tearing.

"Nobody estimates the general rule, 'to let a labor alone that is advancing well, and is natural in its general relations,' more highly than we do; we look upon it as a most wholesome restraint when acted upon; and is every way calculated to diminish ignorant and mischievous officiousness. But this rule, like every other general rule, has its exceptions; and we may be even accused of violating it unnecessarily, when we make the cases under consideration exceptions; but we should feel but little concern upon this head, if the charge be even preferred against us, as we are certain that we are justified in making them, from an ample experience.

"Many, nay, perhaps everybody, (for we have said that we did not know that this case had been noticed,) will condemn what we have said upon this subject, and consider our directions as unnecessary, if not mischievous, because they have never had recourse to them, but have permitted the uterus to perform this duty unaided; therefore they say nature is competent to the work, and when she is competent, she is not to be interfered with. Were this rule rigidly acted up to, there would be an end to improvement, not only in the obstetric art, but in the whole range of practical medicine. Our experience, however, teaches us not to heed this sweeping, indiscriminate rule; for it is not sound practice to permit nature to struggle through difficulties, merely because it is supposed she can struggle through them; and to leave it for some time a moot point, whether or not the case will eventuate in safety, when aid, as certain, as safe, is always at command. Nor does this application of the finger ever produce pain or other inconvenience, if properly and gently managed.

"Beside, much delay is sometimes experienced from this dropping down of the anterior portion of the uterus, by interrupting the pivot-like motion of the head, from completing itself; especially when the head occupies pretty strictly the inferior strait. In this case, the posterior fontanelle will remain for a long time stationary behind one of the foramina ovalia; for its advancement toward the arch of the pubes, is prevented by the prolapsed portion of the uterus interfering with the motion just mentioned, by embracing too strictly the advancing part of the head.

"But the pivot-like motion of the head is almost always restored, the instant we succeed in passing the depending portion of the uterus above the head of the child by the point of the finger, as directed above."

the soft parts as well as of the os uteri. When the vagina is dry, harsh, and hot, warm lard oil, or lard itself warmed into a state of fluidity, may be injected with much advantage; but the parts should never be anointed by friction.

Rigidity depending on disease of the os uteri, may be removed by the above plan, but it can not always be expected to answer. Incising the cervix has been advised as a successful measure in those cases which prove very obstinate and protracted; but I have never had occasion to attempt the operation, probably, from never having had a case of this nature.

When the various means recommended to subdue the rigidity, fail to accomplish this result, and artificial delivery becomes necessary, it is recommended to complete the labor with the forceps, provided the os is fully dilated, and the fetal head has descended so low into the pelvic cavity that an ear can be felt. But if the os is not fully dilated, and the greater part of the fetal head remains above the superior strait, and circumstances present, demanding prompt delivery in order to save the mother's life, the perforator and crotchet *must* be employed, for in such instances, the attempt to deliver by forceps would be rash and unjustifiable; however, it will seldom happen, unless in cases of diseased os, that the treatment above-named will fail in overcoming the rigidity.

The tendency to this cause of difficult labor, as well as of inefficient uterine contractions, may generally be obviated by a proper course of management through the gestating period, or at least during its latter months, in all cases where the physician is aware of his selection as the accoucheur. For a few months previous to the expected labor, he should explain and impress upon his patient's mind, the necessity and advantages to be derived from a proper preparatory course, especially, if any circumstances exist, which might lead him to anticipate a difficult parturition. The course to be pursued at this time, and which has proved generally successful, is, to keep the bowels in a normal condition by diet, if possible, otherwise, by mild laxatives, as Rhei and Bicarbonate of potassa; avoid fatigue, over-stimulus, and improper food, and administer once or twice daily, a dose of the compound syrup of Partridgeberry, or of the Parturient Balm, either of which exerts a healthy tonic influence over the uterus, disposing it to act with proper energy at the time of labor.

The proper position of the uterus is when it occupies the middle of the abdomen, with its longitudinal diameter in the direction of the axis of the superior strait; but in persons of a lax and flaccid habit of body, it frequently inclines anteriorly or laterally, which inclination is termed OBLIQUITY OF THE UTERUS, and which may, by producing rigidity, or other symptoms, retard labor; the positions of the presentations are frequently affected by these obliquities, and the deviations of which, continue, in many instances, even after the uterus has been restored to its normal situation. There are three varieties of obliquity: an anterior obliquity, in which, from excessive relaxation of the abdominal parietes, the fundus uteri falls forward, throwing the os uteri upward and backward in an unusual degree; a right lateral obliquity, in which the fundus falls toward the right side; and a left lateral obliquity, in which it falls to the left side. Among these the left lateral obliquity is more frequently met with. In an anterior obliquity, the female will be very apt to imagine herself larger than usual, or perhaps, that she will give birth to twins. These obliquities may be ascertained by observing that the fundus of the uterus falls to the right, or left, or anteriorly, and that the os uteri, instead of its normal situation in the center of the pelvic cavity, is directed laterally to the right, or left; and in the anterior obliquity it will be found upward and backward, elevated to an extent corresponding, relatively, with the anterior inclination of the fundus. These obliquities, when excessive, especially the anterior, have frequently given rise to the idea that the os uteri was imperforate; and if not readily recognized and overcome, they may occasion more or less serious accidents to both mother and child.

TREATMENT.—This difficulty can be removed, by placing the patient upon the side opposed to the obliquity, or upon her back in the anterior variety; and when this is accomplished, by applying a bandage firmly around the body the organ may be kept in its normal position. In the early stage of labor, it will be found advantageous, in these cases, to keep the patient upon her back, having the shoulders somewhat depressed, and the hips slightly elevated. Any attempt to remove these obliquities by pulling upon the os uteri is highly improper.

Sometimes there is an *Obliquity of the Os Uteri* only, and this is more apt to procrastinate the labor, than when the whole organ is inclined. Upon an examination, the os uteri will be found facing the sacrum, and oftentimes being difficult to reach. Should this condition remain for any length of time, without change, the expulsive [illegible] the uterus being necessarily directed against the anteri [illegible] x. which occupies the open space in the pelvis, ma [illegible] wnward, occasion a rupture at this point.

In a case of this kind the female she [illegible] as possible, and as soon as it can be [illegible] should be hooked by a finger, brought carefully to the center of the cavity and sustained there until one or more subsequent contractions; by pressing the head downward and into the opening, will thus prevent the lip from resuming its previous abnormal position.

Labor is occasionally protracted in consequence of the *Anterior Lip of the Os Uteri being retained between the head and pubic symphysis*, either being caught thus during the dilatation, or occasioned by an unequal dilatation of the anterior and posterior portions of the cervix. This may delay the first stage of labor for several hours. It may be overcome by the following operation, provided, the head does not fill the pelvis too tightly, and the lip of the os uteri is not œdematous from the pressure, or inflamed, in which case, it is better to trust to the natural efforts. The operation is, to gently push the anterior lip over the crown of the head, during the absence of a pain, and retain it there by firm and constant pressure, during one or two subsequent pains, until it retracts and slips over the head. Not unfrequently, this operation will prove unsuccessful, and the continued pressure of the finger upon the lip and soft parts, will cause increased swelling and inflammation; in the majority of cases of this kind, if the constriction of the lip be relieved by pressing the fetal head more toward the pelvic cavity, or toward the sacrum, and holding it thus during a few pains, the lip will retract without any further aid. If the projecting anterior lip be hypertrophied, these manipulations will prove of no utility.

Occasionally, at the commencement of labor, the os uteri may descend with the head, as far as, or even through the pelvic outlet; this must be remedied by placing the patient upon her back, with the shoulders depressed, and the hips elevated—then by gentle and steady pressure with the expanded fingers, return the prolapsed organ to its proper location.

As a common rule, when the os uteri becomes fully dilated, the membranes are ruptured by the internal pressure upon them; but there will frequently be found exceptions to this rule. These exceptions are owing to a RIGIDITY OR TOUGHNESS OF THE MEMBRANES, and which render the labor protracted, by retaining the liquor amnii, and thus hindering the uterus from acting with energy.

TREATMENT.—In cases of this kind, the membranes should be ruptured artificially, after which the contractions will become stronger and more regular. But a proper degree of caution is required before attempting this operation, because, if prematurely effected, it may terminate in more serious results than had no interference taken place.

In the first place, there should be good grounds for attributing the delay to this cause; secondly, before attempting it, the os uteri should be fully dilated and the soft parts in a yielding condition; and thirdly, with primiparæ, it should always, if possible, be postponed until the first stage of labor is completed. Feeble and inefficient contractions for several hours, with softness and dilatability of the parts, and the labor having nearly or fully terminated its first stage, are among the symptoms indicating an artificial rupture. It is sometimes difficult to effect a rupture of the membranes, especially when the pains are feeble, and the use of a probe or sharpened quill has been recommended; I have always succeeded with the finger nail, pressing it upon the membranes during the pain, and making a sawing motion with it from before backward, or from side to side, and continuing it until the liquor amnii escapes.

The dilatation of the os uteri is aided materially in its progress by the mechanical, wedge-like pressure of the bag of waters; but when the MEMBRANES HAVE RUPTURED PREMATURELY, this bag is absent, the fetal head then presses upon the os uteri, but is illy adapted to aid its dilatation, and the result is a tedious labor. The premature rupture may be owing to a weakness of the membranes, to violence, or to a careless examination, and which last is perhaps a more frequent occurrence, than is generally imagined. An early rupture of the membranes is also an indication of a preternatural presentation, and whenever it occurs, the character of the presentation should be determined as soon as possible, that timely measures may be adopted, if required. When the membranes are prematurely ruptured, the liquor amnii may be discharged in a very short time, or if the rent be small, or the fetal head lies over its orifice, this fluid may slowly dribble away, and add much to the discomfort of the patient.

TREATMENT.—If the os uteri is dilatable, and the pains are active, nothing is required but a little patience, as the labor will usually proceed with safety to both mother and child. If, however, the os uteri be rigid and unyielding, this condition must be overcome by the means already mentioned on page 313. If the liquor amnii passes off slowly, the os being dilatable, and the pains feeble, the orifice in the membranes should be enlarged, and the fetal head elevated, between the pains, toward the sacrum, in order to admit of a free discharge of the liquor, and which will be followed by active contractions. The dilatability of the os may be increased by the tincture of Gelseminum administered internally, or by a rectal enema of the compound tincture of Lobelia and Capsicum.

In closing this chapter on the causes which may protract the first stage of labor, I desire to impress upon the mind of the student, that the mere fact of the tediousness of this stage does not justify any attempts to hasten the labor. Delay in this stage seldom causes any serious accident to either the mother or child, unless, from a want of patience and prudence, it be unnecessarily or improperly interfered with. True, the female may become worn out or exhausted, but this is soon removed by an energetic uterine action in the second stage, and in which stage only, is the shock given to the nervous system which may produce unpleasant or serious results. He should, therefore, be very cautious and particular in ascertaining that artificial assistance is positively required, before attempting to render it; always bearing in mind the wholesome and oft-repeated saying of Blundell, that "*a meddlesome midwifery is bad.*" (See quotation of Dr. Washington's method of inducing uterine contractions, and dilatation of the os uteri, in the subsequent Chapter.)

CHAPTER XXIX.

DIFFICULT LABOR.—SECOND STAGE.

THE SECOND STAGE OF LABOR may be protracted, even when the first has progressed favorably, and may be owing to causes not necessarily nor immediately connected with the first stage, or which, although present in that stage, can not be determined until the complete dilatation of the os uteri, and which causes, I shall consequently consider under this head.

As before remarked, although labor may be delayed for a long time during its first stage, without any hazard to the mother or child, yet such is not the case in the second stage, for any procrastination beyond a certain period is fraught with serious consequences to both. The development of bad symptoms may not take place for some hours after the commencement of the second stage, or they may occur within six or eight hours; and, as a general rule, if this stage of labor has continued for twelve or fifteen hours, symptoms of constitutional suffering will manifest themselves. The pains, after having continued regular and forcible for a time, gradually become more and more feeble, occurring at less regular intervals, and causing little or no advance of the head. They may return only at long intervals, or the intervals may be alternately short and long, or they may be regular, the pains gradually diminishing in force, until they are scarcely felt. Or, the pains may commence each time of their occurrence, with energy, but subside, almost suddenly, before they have reached their maximum development; or they may cease entirely.

This impaired condition of uterine action, is very frequently accompanied with several unpleasant symptoms, varying in degree: as, severe shiverings, frequently resembling light convulsive attacks; distressing and frequent vomitings, of green, or bilious matter; restlessness and uneasiness of the patient; the skin may be dry or moist, but in either case it is hot; increase of pulse, ranging from 100 to 140; the tongue dry and furred, with sordes about the teeth; the mind despondent, disturbed, and fearful; the vagina hot, and with the os uteri, tender to the touch; the mucous discharge from the vagina becomes brown or yellowish, and occasionally fetid or acrid; and urination is rendered difficult, or altogether prevented by the pressure of the fetal head. These symptoms usually occur in the order just given, and in all cases of prolonged second stage, some of them will be present. If relief be not afforded, they increase in severity; the vomiting occurs more frequently, with ejection of dark-colored matters; restlessness increases, with obstinate hiccough; the abdomen becomes tender; the skin covered with a cold, clammy sweat; the pulse rapid and feeble; the tongue dry and brown; stupor and low-muttering delirium ensues, and death terminates the scene. Not only is the life of the mother endangered in such cases, but also that of the child, by the delay of proper interference.

One of the most common causes of delay in the second stage, is a CESSATION, OR INEFFICIENCY OF THE UTERINE CONTRACTIONS. As may have been observed in the previous chapter, this is also a cause of prolonged first stage, but its effects are by no means so grave in that stage. It may be owing to disease, sudden and violent emotions of the mind, tumors, constitutional debility, etc. Females of an irritable, nervous temperament, may have labor protracted, during its second stage, from this cause; and those of debilitated constitution, frequently have a failure of uterine action in this stage, and, especially, when from prolongation of the first stage, great exhaustion occurs.

TREATMENT.—When attending a case in which the action of the uterus becomes lessened, the pains short and inefficient, or at long intervals, with no advance of the fetal head; increased and irregular pulse, restlessness, anxiety, and wakefulness being also present, it will become necessary for the practitioner to institute a very minute and careful examination, not only of the genital organs, but likewise of the condition of the tongue, pulse, skin, head and abdomen. By the examination of the genital organs he will ascertain, if possible, the cause of the delay, and determine by it the best method of affording assistance; and by the condition of these parts, in connection with the general condition of the system, he will be guided as to the proper time for interference.

The *cause of the delay* can, of course, be learned only from the examination. The *best method of affording assistance*, is, invariably, that which terminates the labor most easily, and with the least danger to the mother and child. Among these means may be named, Ergot, the Vectis, the Forceps, and the Crotchet; each of which will be considered hereafter. The *proper time for interference*, will depend entirely upon the symptoms; an increase of the pulse, febrile symptoms, soreness and tension of the abdomen; exhaustion; watchfulness, and anxiety; a dry, hot, puffy, or swollen condition of the soft parts, caused by the long-continued pressure and interrupted circulation, and accompanied with a degree of tenderness which renders a vaginal examination painful; a retention of urine, from pressure of the fetal head on the urethra and neck of the bladder, requiring the use of the catheter, which can be introduced only with difficulty; and a change in the character of the vaginal discharges, they becoming offensive—are all symptoms requiring immediate delivery. Indeed, as a general rule, it is good practice to interfere, even before the local symptoms have appeared.

If, in cases of protracted labor from rigidity, the constitutional disturbance is excessive, with exhaustion of the vital forces, and determination of blood to particular organs, especially the brain, the prognosis is very unfavorable. Fever, in either stage of labor, manifested by chills, increased pulse, furred tongue, and flushed countenance, indicates the want of artificial aid; and the case assumes a still more serious aspect, if the pains gradually lessen in frequency and power, the fetal head ceasing to advance, and the female becoming exhausted. Sometimes, these symptoms come on very suddenly, requiring an immediate interference; the pains cease, the mind becomes confused and wandering, a clammy perspiration covers the face and body, restlessness with constant hiccough occurs, and the patient becomes so completely changed in features and in the tone of voice, as to be hardly recognized by her friends.

These symptoms may occur during the first stage, but they will be more frequently met with in the second stage, where the head has passed through the os uteri into the pelvic cavity, and has been pressing for a considerable time upon the parts at the inferior strait.

It is frequently the case that the contractile power of the uterus is so readily exhausted, that after having effected the first stage of labor, the pains cease, or become very feeble in the second. In these instances, the pelvic diameters will be sufficiently ample, the soft parts in a yielding condition, and the head, in whatever portion of the cavity it may be, will be found in a normal position. In such cases, the female should have a bandage placed around the abdomen, sufficiently tight to make some pressure upon the uterus, and should frequently change her position, sitting, lying down, and walking about the chamber, alternately; Caulophyllin or Cimicifugin should likewise be administered in doses of two or three grains every fifteen, or thirty minutes; and if these fail, and symptoms of exhaustion manifest themselves, it will then be proper to administer Ergot. And, indeed, this course may be pursued in all cases of inefficient uterine contraction, owing to mere debility or exhaustion of the organ. Notwithstanding that Ergot has been so frequently employed to facilitate labor, with no apparent immediate pernicious results, yet the practitioner should ever bear in mind, that it is a dangerous remedy at best, requiring much judgment and discrimination in its employment. The dangers attending its use, to the mother, are, rupture of the uterus, rupture of the perineum, inversion of the uterus, etc.; to the child, death, and more certainly if the cord is around its neck. And, although it has been employed with impunity, in many cases, where the only indication for its use was the impatience of the practitioner—a regard to his own comfort and feelings, in preference to the safety of his patient—still, it is an agent whose action is always to be dreaded; and the success attending its administration in the instances just referred to, have been the results of good luck, and not of any superior skill or wisdom of its prescribers.

Ergot has, undoubtedly, a specific action upon the uterus, which usually commences within twenty or thirty minutes after its exhibition; and the character of the contractions produced by it are materially different from those of natural labor. They are stronger and of longer duration, resembling a number of violent or spasmodic uterine contractions continued into one another without intervals. During a contraction, the circulation of the maternal blood in the uterus and placenta must be interrupted; and when this interruption occurs for a long-continued time, as when effected by ergotic influence, preventing the necessary changes in the fetal blood, we should anticipate unfavorable results to the child, and not be unexpectedly astonished upon finding it born in an asphyxiated condition.

As it is not uncommon to meet with individuals whose constitutions are insusceptible to the specific influences of one or more drugs, so must we expect to meet with females upon whom Ergot exerts but little or none of its peculiar action; and this want of susceptibility may account for many of the failures which have been recorded by authors. Another cause of failure has been, undoubtedly, the want of a recent article; for Ergot, especially when in powder, rapidly loses its property of exciting uterine action by keeping; and, no matter how carefully it may have been preserved, it is very apt to become worthless in one or two years. The best mode of preserving it, is to dry it quickly in the sun, or by artificial heat, and then place it, unpulverized, in well-corked vials, into which a few lumps of camphor should be deposited. These should be kept in a dark situation, and where the temperature is rather constant, ranging between 50 and 80 deg. Fahrenheit. It should be pulverized only when required for use. Good Ergot, when pulverized, has an odor somewhat resembling that of new-mown hay; when of inferior quality, it has a musty smell. It is usually given, during parturition, in infusion or tincture. The infusion is of a dingy violet color, and the tincture of a dark reddish-brown. The ethereal oil has likewise been administered with good effect.

In the administration of Ergot to females during parturition, there are certain rules to be guided by, which are based upon the recorded experience and observation of many medical men, and which should be thoroughly impressed upon the mind of every individual who attempts the conduct of a labor; they are briefly as follows:

Ergot should never be given for the relief or comfort of the practitioner; where any deformity of the pelvis is suspected; where the head is suspected to be disproportionably large; where the presentation is beyond reach, or cannot be determined; where there exists an obstruction in the soft parts, as rigidity, etc.; where there is a mal-presentation; where there exists increased excitement of the nervous or vascular system; where there is a tendency to cerebral symptoms; and where the os uteri is not fully dilated. It should never be given while the woman's strength is greatly exhausted, lest the exhaustion produced by it be more excessive than her system can bear.

Ergot should be avoided, as much as possible, in first labors, lest rupture of the perineum ensue.

Ergot may be given, IN CAREFUL HANDS,—in multiparæ, where the sole cause of delay is deficient uterine contraction; where the head presents and is low in the pelvis, the os uteri soft and fully dilated, the soft parts yielding and dilatable, and the membranes have ruptured; and the pelvis must be ample, with normal proportions between it and the fetal head. The patient must also be somewhat exhausted, but without any symptoms of fever or inflammation.

Many authors recommend the administration of twenty or thirty grains of Ergot in powder, or infusion, for a single dose; but in my own practice, in all cases where I have considered its use indicated and advisable, I have succeeded in arousing the contractions of the uterus, in fifteen or thirty minutes, by the following course:—To about four fluidounces of Boiling Hot Water, add one or two drachms of good Ergot, in coarse powder, and when this is sufficiently cool, tablespoonful-doses of the infusion are given every five or ten minutes. Should the tincture be preferred to the infusion, it may be exhibited in doses of half a fluidrachm or a fluidrachm, every ten or fifteen minutes: the dose of the oil is from ten to thirty drops in water, tea, or some aromatized syrup, and which may be repeated every fifteen, twenty, or thirty minutes.

I would remark here, however, that among those practitioners who are acquainted with the parturient virtues of Cimicifugin and Caulophyllin, or even of the crude roots from which these resins are obtained, the employment of Ergot for the purpose of inducing (spasmodic) contractions of the uterus, is very seldom required. And it is always advisable, in the cases under consideration, to give these agents a fair trial before resorting to the ergotic preparations; more especially as they may be exhibited with greater safety, and at an earlier period of labor; beside, the contractions they induce bear a greater resemblance to those caused solely by the natural powers.

It will sometimes be found, that although the contractions of the uterus may be aroused by the administration of Ergot, they are not of an expulsive character; in such cases the uterus contracts firmly upon the part of the child within it, preventing its advance, and causing its death by the pressure maintained around it, unless timely assistance be afforded by the employment of the forceps. Hence, it is recommended by our best accoucheurs, to have a forceps at hand, when this drug is exhibited. It must be recollected, however, that so long as the pains continue, with an advance of the head, *however slowly*, the pulse continuing good, no trouble in urinating, and no pain of the abdomen on pressure, ARTIFICIAL INTERFERENCE IS NOT REQUIRED; but in debilitated patients, in whom symptoms of exhaustion and fever appear, interference will be demanded, even though the head be very slowly advancing. And by delaying the necessary aid, the patient may die after delivery, from the shock of the labor, or from hemorrhage and retained placenta or, should life be spared, sloughing of the uterus, vagina, bladder, and rectum may take place, rendering her subsequent existence painful and burdensome in the extreme.

Sometimes, the second stage of labor may be prolonged by RIGIDITY OF THE SOFT PARTS, especially of the perineum. In such cases a resort to Ergot, or the forceps, while the rigidity remains, is highly censurable. Occasionally, during the advance of the fetal head, the os uteri, instead of yielding, grasps the head during each pain, and prevents its further progress; this is apt to alarm the practitioner, who, having ascertained that the position of the head is correct, finds it to remain stationary, notwithstanding pain after pain continues with much force and severity. A careful examination, as to the presentation and position of the head, and its relative proportions with the pelvic diameters, may determine the cause of the delay. The same cause frequently prevents the head from rotating.

TREATMENT.—Patience is required in these cases, in conjunction with the means named for overcoming rigidity, in the previous Chapter. In the instance of rigid os delaying the advance of the fetal head, it will always be proper to correct any abnormal position of the uterus which may be present, so that its longitudinal axis may correspond with the axis of the superior strait.

The following abstract from the Nashville Journal of Medicine and Surgery, is taken from Braithwaite's Retrospect, part 28, for January 1854, p. 273.

"Dr. Washington has recently discovered that dry-cupping, applied to the lowest part of the sacrum, produces dilatation of the os uteri; and, applied higher up, contraction of the uterus. In a case, where the pains had endured fourteen hours without producing any perceptible effect, in consequence of rigidity of the os uteri, Dr. Washington applied a dry cup as low down on the sacrum as possible, so as to cover the origin of the nerves to the os uteri. Complete relaxation ensued; at the next pain, the head descended to the outlet; and at the second pain the patient was safely delivered; and that in less than ten minutes from the application of the cups. In tedious labor, the cup should be applied first to the lowest point of the sacrum, and if, in the course of ten or fifteen minutes, the patient is not delivered, another should be applied higher up, so as to cause the uterus to contract. *The lower one should always be on when the upper one is applied, so as to insure relaxation* of the os uteri when the pains come on.

"In retained placenta, the cups are to be applied higher up, so as to cause the uterus to contract at once, the relaxation of the os uteri being always sufficient after the fetus has passed. When Ergot is administered, the woman is delivered by main force, without any relaxation *except* that produced by the most fearful pains. By dry-cupping, two or three pains are sufficient, and the amount of suffering is not more than ordinary."—*Association Med. Journal, May* 27, 1853, *p.* 469.

Should the method named in this statement be found generally efficacious, the discovery will prove a great blessing to parturient females in several other respects, and the Science of Obstetrics will be deeply indebted to its discoverer. It is simple and safe, and is certainly deserving a trial in all protracted labors from rigidity of the os, or debility of the uterus, before resorting to the administration of Ergot.

SHORTNESS OF THE UMBILICAL CORD, may be a cause of protracted labor. It may be very short, naturally, not exceeding six or seven inches in length, so that it becomes torn as the trunk and inferior extremities are expelled, or its ligation and division may be required before these can be extracted. Most commonly, however, the shortness of the cord is accidental, occasioned by its being twisted several times round the neck or body of the fetus. The delay in the progress of the labor may be suspected to depend upon this difficulty, when in either stage of labor, the head not only retracts upon the subsidence of the pain, but does not advance with the usual force when the pain is present; sometimes the cord may be so shortened, and the head held up so high, as to prevent the practitioner from ascertaining the presenting part until the commencement of the second stage. Should the placenta be attached to some portion of the uterine cavity, near the neck, instead of toward the fundus, the above symptoms will be absent, and the diagnosis will be very obscure. But to whatever part it may be attached, a sensation of dragging, or tearing, with pain, is experienced by the patient during the expulsive contractions, whenever the cord is shortened.

Should the case be suspected a shoulder presentation, from the fact that at the full dilatation of the os uteri, the presenting part cannot be felt, the practitioner may be induced to attempt turning, but the introduction of the hand within the uterine cavity, at once ascertains the presentation of the head retained by a short cord. When, in the second stage, the head presents in a proper position, and is of normal size, the soft parts being free from any rigidity, the head in any part of the pelvic cavity, and the pains regular, shortness of the cord may be suspected when the head is found to recede very much with the cessation of the pains, and making no further advance when they are on, for several hours in succession. If two fingers, or even the whole hand, be passed up as high as possible, between the head and symphysis pubis, the diagnosis will be positive, upon feeling the cord passing around the neck.

TREATMENT.—If the pulsations in the cord be strong and vigorous, the best practice is to have patience, and leave the case to nature. If the pulsations are feeble, or gradually becoming so, we are recommended by Dr. Lee to deliver immediately with the forceps, and to carefully abstain from the use of Ergot. To attempt turning, in such a case, would be downright stupidity.

Prof. Meigs recommends loosening the cord by pulling upon its yielding end, and endeavoring to cast it off over the head. "This," he says, "cannot always be done; if so, in any case, let the child pass through it by slipping it down along its body over the shoulders. If it seems impossible to slip the cord over the head or shoulders either, it should be let alone; and in a great majority of cases it will not prevent the birth from taking place, after which, the cord can be cast off. Should the child seem to be detained by the tightness of the cord, as does rarely happen, or in danger from the compression of its jugular vessels, the funis may be cut with the scissors, and tied after the delivery. Under such a necessity as this, a due respect for one's own reputation should induce him to explain to the bystanders the reasons which rendered so considerable a departure from the ordinary practice indispensable." It is not always, however, that the cord can be reached, at least so as to pull it down, or otherwise operate upon it, and in such instances, we must expect the means recommended by Prof. M. to be impracticable. Should the child be dead, as ascertained by absence of the beating of the fetal heart, and the cessation of pulsation in the cord, the labor should not be interfered with.

Occasionally, HYDROCEPHALUS in the fetus is a cause of difficult labor; in which case, notwithstanding the dilatable condition of the os uteri, the head remains above the superior strait, and if the cause be not early ascertained, exhaustion, or rupture of the uterus ensues. The danger is in proportion to the size of the child's head; where the effusion is inconsiderable, the soft and flexible condition of the head may admit of its delivery, by gradually adapting it to the canal through which it has to pass, and lengthening its long diameter very considerably. But when the effusion is abundant, and the diameters of the head exceed those of the pelvis so much as to render delivery impossible, interference will be demanded. If a dropsical head be allowed to remain for any time impacted in the pelvic cavity, the continued pressure it exerts upon the soft parts would be very apt to produce sloughing; and in nearly all those cases, where the cause of the delay has not been easily ascertained, a fatal result has followed to both the mother and child.

A hydrocephalic head may be detected by the extraordinary size of the head, and the great separation of its bones, by which the sutures are enlarged to the size of a finger, or more in breadth, and the fontanelles being also augmented, at times, to an extent equal to the hollow of the hand. And, likewise, during the intervals between the pains, a sense of fluctuation will be perceived in some places, though this sensation may not frequently be observed, owing to the great compression the head undergoes.

TREATMENT.—But one course is to be pursued in a difficulty of this kind, when we are certain that the head cannot be delivered naturally, or without endangering sloughing of the maternal soft parts, and when we are also *positive* that hydrocephalus is present. The necessity for being enabled to detect presenting parts, as well as their condition, is fully shown in a case of hydrocephalus; for should a careless or ignorant practitioner neglect to ascertain the positive conditions present in a difficult labor owing to this cause, and administer Ergot, or other agents, to excite energetic contractions of the uterus, he would be very apt to occasion a rupture of this organ; or should the head be expelled, it would be at the hazard of the mother's life, from sloughing.

In hydrocephalus, where the head cannot be delivered by the natural powers, the best chance for the mother's safety is, to evacuate the effused fluid by puncturing with the perforator at an early period, while she has sufficient strength and vigor to withstand the shock; if the operation be delayed too long, she may die from rupture of the uterus, or from exhaustion. After the evacuation of the fluid, the collapse of the bones will permit the labor to be terminated by the uterine contractions alone; and if these fail, means may be employed to excite them into greater activity, or the forceps may be demanded. Hydrocephalus is not always readily detected during labor, and when it is, the discovery is usually too late for the mother to derive any advantage from it, as it most always terminates fatally.

Should the case be one of pelvic presentation, and the head delayed from disproportion, the perforation must be made behind the ears.

Sometimes *Ascites* or *Dropsy of the Abdomen*, may prevent the body of the child from being expelled; or this may occur from *Tympanitis* or a *Distension of the Abdomen with Air;* in these cases the perforator must be thrust into the child's body, and the air or fluid evacuated.

Labor may be rendered difficult by VAGINAL VESICOCELE *or* VAGINAL CYSTOCELE, in which the urinary bladder falls from its proper position in front of the uterus, and descends below the fetal head, overlapping the pelvic brim. The head, in its descent, pushes the fundus of the bladder before it into the excavation, forming a tumor of greater or less size at the anterior-superior part of the vagina, and which, if not timely relieved, may terminate very seriously. Sometimes the depressed bladder has been found directed to one side of the pelvis. The patient experiences a sensation of weight or fullness in the pelvis, a dragging sensation about the umbilicus, with a constant, but ineffectual desire to urinate; though, a small quantity of urine may pass during each uterine contraction. On an examination per vaginam, the finger detects a more or less oval tumor, usually in front of the pelvis, which is smooth, soft and fluctuating during the intervals between the pains, but hard and tense while they are on, and painful on being steadily pressed. The head of the child is only partially covered by it, and may be felt by passing the finger above and behind it; but any attempt to slip the finger between the tumor and the symphysis pubis, will prove unsuccessful. Some care will be required lest it be mistaken for the bag of waters, or a hydrocephalic head, and improperly punctured.

TREATMENT.—This difficulty, whenever met with, must be promptly remedied. A male elastic catheter should be introduced into the bladder, having its point directed backward and downward, and to facilitate its introduction, the head may be slightly elevated with one or two fingers; the whole operation must be done during the absence of a contraction, and it may be effected more readily by entering the point of the catheter, with the hand below the vagina, and as it passes on toward the bladder, gradually raising the hand. After the urine has been withdrawn, the bladder must be pushed upward, by one or two fingers, above the top of the pubes, and held there till a pain thrusts the presenting part of the child below it. Should it be impossible to introduce the catheter, attempts must be made, during the intervals, to press up the head, and at the same time also press up the tumor, when, frequently, the urine will be discharged without the aid of a catheter. If these attempts fail, and the progress of the labor is checked by the tumor, or a rupture of the bladder is feared, from its over-distension and from the pressure, the only resource is to puncture the presenting inferior surface of the bladder with a very fine trocar, having a consultation previously, if possible, with some skillful physician. In these cases, the patient should be carefully watched after delivery, evacuating the bladder at once, and not allowing it, for some days, to become distended to any extent, with urine.

As these instances are more apt to occur in the first stage of labor, and when the bladder is more or less filled with urine, the necessity for keeping the bladder evacuated at such a time, will be readily seen. It may be proper to observe here, that no tumor in the pelvis, especially those presenting fluctuation, should ever be punctured, without having first employed the catheter, to ascertain that it is not vesical.

Very rarely, a CALCULUS IN THE BLADDER may prove an obstacle to the labor, by projecting backward, and then pressed downward by the head, thus seriously bruising the bladder. It is not always easy to diagnosticate this difficulty; it will present as a hard tumor of greater or less size, circumscribed, painful on pressure, whether of the finger or child's head; and the diagnosis may be still further verified by the introduction of a sound or catheter into the bladder. Relief may be attempted, if the head has not descended too far, by pushing it up above the strait, and then pressing the calculus upward and anteriorly. If, from any cause, this can not be effected, vaginal lithotomy, with the consent of counsel, is advised.

COLLECTION OF FECES IN THE RECTUM, may interpose as an obstacle to the passage of the head. These form a rather hard, irregular, inelastic tumor, which will be felt in the situation of the rectum, and which when pressed upon, downward, will slowly yield and cause the escape of feces. An examination per anum will at once detect the hardened scybalæ. This condition seldom happens except among careless and inattentive females, and a proper attention to the condition of the bowels at the early stage of labor, by the practitioner, will prevent its occurrence.

TREATMENT.—The feces should be removed by injections of warm water; or, should they be so hard and compact as to resist this method, it will then become necessary to remove, as much as possible, by a scoop, spatula, or the handle of a spoon, after which administer an injection of warm water.

A portion of intestine may become engaged in the *cul de sac* between the rectum and the posterior wall of the vagina, and form a tumor of variable size. This VAGINAL HERNIA, especially when it contains fecal matter, opposes the descent of the head, and, from the pressure of the head upon it, may terminate in serious inflammation, and even gangrene.

TREATMENT.—The hernia must be reduced as promptly as possible; the woman must be placed on her knees and elbows, with the hips elevated, and the intestine returned by pressure with two or three fingers. In some cases it may be necessary to relax the system by means of Gelseminum, when the patient will lie upon her back, with the thighs flexed upon the abdomen, and supported there by assistants, while the reduction is attempted. If the reduction can not be accomplished, the labor may readily be terminated by the forceps, if required.

IMPERFORATE *or* UNRUPTURED HYMEN, may prevent the passage of the head. Impregnation may be effected without lacerating the hymen, which will be found perfect at the period of labor. It usually yields to the pressure of the head, but should it resist for too long a time, a slight incision may be made into it by the scalpel, taking care to prevent the laceration from extending into the perineum, as the head passes through the external orifice, by giving careful support to the perineum.

Where, from a *continued* DELAY OF THE CHILD'S HEAD *in the Pelvic Cavity,* the circulation of the parts becomes interrupted, the soft parts are apt to swell, thereby offering still greater opposition to the advance of the head, and which may terminate in some structural lesion of the parts, if prompt and energetic measures be not adopted. Dr. Campbell observes, "Unless a practitioner has had the management of the patient from the commencement of labor, he is apt to view this variety of diminished capacity, as arising from original defect in the development of the bones themselves."

TREATMENT.—This condition may be overcome, to a great extent, by emollient vaginal injections, or injections of warm lard or oil, either alone, or previously boiled with the flowers of St. Johns-wort; and if necessary, relaxation may be produced by the administration of Gelseminum or Lobelia. Should the pains be feeble, labor may be facilitated by an injection into the rectum of compound tincture of Lobelia and Capsicum, slightly diluted with water; or Cimicifugin, Ergot, etc., may be exhibited according to the directions heretofore given, when treating of inefficient action of the uterus. The forceps have been advised, but I should, in these instances, fear some injury to the parts from their employment. I have frequently given the Gelseminum to cause relaxation, and when produced, have followed it with tincture of Ergot, with the happiest results, in cases requiring an expeditious delivery, where the pains were feeble, with a degree of rigidity or tumefaction of the soft parts.

ŒDEMA OF THE LABIA MAJORA, is sometimes so great at the time of labor, as nearly to obliterate the vaginal entrance, rendering the delivery difficult and very painful; and the pressure of the fetal head in its passage over the tumefied parts, may cause an extensive rupture, or produce gangrene. The same treatment may be pursued as in the preceding instance, but, if the tumefaction be very excessive, or the labor considerably advanced, it is recommended to puncture the engorged parts with the lancet, in different places, the number of punctures depending on the extent and degree of œdema.

A CICATRIX IN THE VAGINA, will sometimes be met with, which will present an impediment to the delivery; it is usually the result of sloughing effected in a previous tedious labor, in which, the healing of the ulcer which remains after the separation of the slough, occasions a diminution of the diameters of the vaginal canal. An examination will detect, at some portion of the vaginal wall, a firm, unyielding band, which may occupy from three to six lines longitudinally, or which may present merely a very thin edge, the thickness of a wafer. The difficulty will, of course, be proportioned to the firmness and extent of the cicatrix.

TREATMENT.—In these cases we should not interfere prematurely, but always wait and learn what the natural efforts can do; strong and energetic contractions, with the pressure of the fetal head, may overcome the difficulty. But where assistance is required, relaxation, effected by the compound tincture of Lobelia and Capsicum, administered by mouth, and by rectal enema, with applications within the vagina over the constricted part, of Elm and Lobelia in fomentation or injection, will usually produce the desired dilatability, and the head will advance without any further delay. Where the cicatrix is of great extent, and very firm and unyielding, it is advised by excellent authority to slightly incise the edges of the constricted part in three or four places, being careful to avoid the neck of the bladder, the rectum, and the two uterine arteries, which pass up from below on each side of the vagina; and for this purpose the incisions should be made one behind each groin, and one toward each sacro-iliac symphysis. The least snip is sufficient, as the advance of the head will probably widen it. After the delivery, a sponge or bougie, well oiled, should be introduced into the canal and changed two or three times a day, so that as the part heals, the diameters of the vagina do not again become lessened. The artificial increase of the vaginal passage by incisions, should be attempted with great care, and under the advice of counsel, for, however slight the operation may be, the advance of the head may cause the cut to widen and produce a much more extensive laceration than if the case had been left to the natural powers. Indeed, I am somewhat inclined to believe that the operation will very rarely be found necessary, where the previously-named treatment has been faithfully pursued. Sometimes considerable hemorrhage follows, and cases have occasionally terminated fatally. If the contractions of the uterus become inefficient, or unfavorable symptoms present themselves, the labor may demand a prompt termination by instruments, the use of which, in such cases, even with the greatest care, is apt to produce more or less extensive lacerations, and which are not without danger; and a knowledge of this fact may lead to the practice of patience and caution.

Where the practitioner is aware of this difficulty at an early period during gestation, or has reasons to suspect it, it is proper for him to explain the matter to his patient, and request an examination, when if the constriction be found very great, he may induce premature labor, and thereby save the mother the hazards that she would run at full period; and the same course may be pursued with females known to be laboring under *Cancer of the Os Uteri.* In this latter condition of the cervix, at full term, when the labor is delayed thereby, it may become necessary to divide the diseased part sufficiently to admit the passage of the child. But, as this operation is only to be attempted for the child's safety, we must be certain that it is alive before performing it; the death of the mother is to be expected in such cases, no matter what course is pursued. *Cauliflower Excrescence* may be similarly managed.

Very rarely, the labor is interfered with by an IMPERFORATE OS UTERI, which may be suspected, when the pains are regular, increasing gradually in force, pushing the lower segment of the uterus into the cavity of the pelvis, rendering it very thin, without any opening of the os uteri being discoverable.

There may be an *Agglutination of the Os Uteri,* the result of some previous inflammation of the part, and which may be detected by finding an indentation, or depressed fold at the center of the os uteri, without any opening; the pains will be regular, increasing gradually in force, pushing the lower segment of the uterus into the cavity of the pelvis, rendering it extremely thin; or the *Os Uteri may be Obliterated.* These conditions, are, however, rarely met with.

TREATMENT.—It may be that the os uteri is merely rigid and not dilatable, and the means recommended for this difficulty may be pursued, whenever the os can be discovered. Sometimes the os uteri is closed by agglutination, resisting the most powerful uterine contractions; in such instances, Dr. Rigby remarks, "A moderate degree of pressure against it while in a state of strong distension, either by the *tip* of the finger or a female catheter, is quite sufficient to overcome it;

little or no pain is produced, and the appearance of a slight discharge of blood will show that the stricture has given way."

If no opening, however, can be found, it will become necessary to divide the presenting wall of the uterus, and form an artificial os uteri, through which the child may pass. A crucial incision is to be made upon the anterior-inferior part of the wall, as near the situation of the os uteri as possible, by means of a sharp-pointed bistoury; this knife is carefully passed along the left fore-finger as a guide, and must not be pushed too deeply into the uterine wall, lest the presenting part of the fetus be injured. In performing the antero-posterior incision, care must be taken not to extend it so far, either forward or backward, as to injure the bladder or rectum. After the operation, the delivery may be left to the natural efforts.

It must be recollected, however, that it is frequently the case, that from uterine anterior obliquity the os uteri will be high up, perhaps entirely beyond the reach of the finger, and looking toward the promontory of the sacrum, and in which position it may remain for several hours, retarding the progress of the labor. And a careful search should always be instituted previous to attempting any operation. If it be found thus elevated and inclined, the labor may be expedited by drawing it downward and forward with one or two fingers, in the direction of the axis of the superior strait, and holding it there until the engagement of the head will prevent a return to its former inclination.

Sometimes the orifice of the os uteri will be found so minute or contracted, from disease or other causes, that the head can not pass through it, even when dilated; for which the same course must be pursued as named for cancer of the os uteri, being careful in all operations not to carry the incisions into the rectum or bladder.

I would remark here, that some of these latter conditions, existing as causes of difficult labor, may be found present in the first stage of labor, when they should be as promptly attended to as the circumstances of the case will permit; preparing tho parts, if possible, so that no delay may take place during the second stage.

CHAPTER XXX.

ON DIFFICULT LABOR, FROM TUMORS, PELVIC DEFORMITIES, ETC.

THE capacity of the pelvis is occasionally diminished during labor, by the presence of *Tumors in its Cavity*. These tumors may vary in their size, consistency, and pathological characters; they may be osseous, fibrous, adipose, steatomatous, sarcomatous, or scirrhous, and the difficulty occasioned by them, will depend upon their size and degree of solidity. The history and surgical management of these tumors, together with other details, are not within the province of this work, in which I will merely refer to the diagnostic signs, and the indications for treatment when they interfere with the progress of labor.

A hard, bony tumor of extremely rare occurrence, termed EXOSTOSIS, has been met with. It takes its origin from some portion of the osseous parietes, more commonly from the sacro-iliac symphysis, and sometimes from the first bone of the sacrum, from the last lumbar vertebra, from the internal surface of one of the ischia, or from some portion of the posterior face of the pubic bones; and may be detected by its hard, knotty and irregular feel, its insensibility to pressure, its immobility, and its projection into the interior of the vaginal canal, but always covered by the wall of this canal.

TREATMENT.—It is possible, that when the tumor is very small, the labor may progress without assistance, but when it is large, so as to materially interfere with the capacity of the pelvic diameters, the case assumes a more serious aspect. As we can not remove this obstruction by an operation, we must be governed by the nature of the case. If there is a probability that the head may pass, it will be prudent to wait until symptoms, demanding artificial delivery, present themselves, when the labor may be terminated by the forceps, or perhaps the perforator. When the diminution of the pelvic cavity, from this cause, is so great that the fetus can not pass through the vagina, the only chance for the mother will be in the performance of the Cesarean operation. Fortunately, these instances are rare; I have never met with one.

Other osseous tumors may occasionally render a labor difficult, as OSTEO-SARCOMA *of the Pelvis;* this is very difficult to distinguish from exostosis; it presents greater inequalities, has a semi-cartilaginous softness, a degree of depressibility, and at some parts of its surface crepitation may be observed. From the depressibility of this tumor, the pressure of the head may flatten it, and effect a sufficient amplification of the parts to admit of the passage of the fetus; and should the natural efforts fail, or symptoms appear requiring interference, the labor may be terminated, according to circumstances, as in the preceding difficulty.

Sometimes the pelvic cavity may be diminished by bony protuberances, depending upon irregular consolidation of fractures in the part, or perforation of a carious acetabulum by the head of the femur, etc. In these cases, whatever may be the situation of the protuberance, the indications for treatment will be the same as in pelvic deformities.

Vaginal cystocele, vaginal hernia, œdema of the labia majora, cancer of the os uteri, and calculus in the bladder, have been referred to in the preceding chapter. Beside these, there are other swellings or tumors which may interfere with the passage of the child's head through the pelvic cavity, and which will demand some interference on the part of the practitioner: thus—

FIBROUS TUMORS of the CERVIX UTERI, are occasionally met with, instances of which are recorded, where the labors were finished without more than ordinary assistance, the mothers recovering, but the children being still-born. In such cases it is better to delay all operations, if there is the least possibility of the delivery being effected by the natural powers; but when this is impossible, from the excessive size of the tumor, from the want of proper uterine contractions, or from exhaustion of the mother, the child will have to be extracted by means of embryotomy, or if this be impracticable, by the Cesarean operation.

A POLYPUS, may arise from the body or neck of the uterus, or it may be adherent to the walls of the vagina, and in either case present an obstacle to the delivery. It may be known by its firm, fleshy feel, its movability, its pear-shape, and its long and narrow neck: during labor it has sometimes been mistaken for the child's head.

TREATMENT.—If the tumor be detected at an early period of labor, it might be prevented from descending, by pressing it back during the absence of a pain, and holding it thus until the head has passed beyond it; but this is not practicable in all instances, and especially when the tumor is very large. In every case of this kind, it will be proper to trust for a time to the resources of nature; but when the parts become hot, dry, and swollen, and the uterine efforts inefficient, interference is required, for a too protracted delay is hazardous to both mother and child. The only operation necessary, is the removal of the tumor by excision, and not perforation of the child's skull; for the danger from hemorrhage after the operation is not so great as to justify the destruction of the child. "The polypus should be drawn down as much as possible by a forceps proper for the purpose, a temporary lig[illegible]l, and the stem cut through." "It is not likely that [illegible] brought to maturity, if a large polypus occupied [illegible] it is therefore fair to assume, that when a pol[illegible]rition, it must be attached to the mo[illegible] can be the more easily traced to its origin, so that you have every facility to assist your diagnosis."—(*Murphy.*) If the presence of a polypus in the pelvic canal be discovered during the latter period of utero-gestation, and its size be such as to possibly render labor protracted and difficult, it should be at once ligated and excised.

The ovary is liable to several diseases, which augment its volume to an enormous extent. Among these, dropsy and scirrhus are the most common; and if, at the time of parturition, an OVARIAN TUMOR is present, it may become a cause of difficult labor by impeding the birth of the child. Generally, as the gland enlarges, it gradually rises from the pelvic into the abdominal cavity, where, from its bulk, it may interfere with the development of the uterus and occasion a premature labor; or else, by pressing this organ to the side opposite, it may give rise to a difficult labor, by producing a uterine obliquity. Frequently, however, adhesive inflammation causes the ovary to remain within the pelvic excavation; or it may have been prevented from ascending into the abdominal cavity by the gravid uterus having already occupied that space; in either of which instances, if the female arrives at the full term of utero-gestation, the labor must be exceedingly difficult, depending, however, on the size and character of the tumor.

The diagnosis of an ovarian tumor, at the period of labor, is not always an easy matter. It will be found external to the vaginal coats, commonly toward the posterior part of the pelvis within the recto-vaginal septum, will be more or less movable, elastic, and fluctuating, or hard and apparently solid, with some degree of sensibility. The dropsical tumor presents a round, smooth, and polished surface, while the scirrhous one presents nodules and irregularities. It is proper to examine in these cases both by vagina and rectum simultaneously, for the purpose of more clearly determining them from vaginal or uterine tumors.

TREATMENT.—In the management of these cases, much will depend upon the size and character of the tumor, bearing in mind that these tumors are "more likely to be moved out of the way of the child at the time of labor, than any other, and also more apt to give way and burst under the pressure of the head."—(*Churchill.*) If the tumor be detected previous to the engagement of the head at the superior strait, and it is movable, attempts should be made to push it up above this strait by steady pressure, so as to place it beyond the head. If this cannot be accomplished, we must rely upon the natural powers, until the symptoms demand our interference. If the tumor be soft, it may be flattened, or ruptured, and thus allow the head to advance; if it be solid, we certainly should not interfere until we are compelled to. When the removal of the obstacle cannot be accomplished, and interference is called for, it is recommended to puncture the tumor by means of a trocar, and evacuate the fluid; and if the contents of the tumor be viscid, or gelatinous, not passing readily through the canula, or if the tumor be formed of numerous cysts not communicating with each other, the opening must be enlarged by making an incision into the tumor of half an inch or an inch in extent. When the tumor is located between the sacrum and rectum, it is recommended to make the puncture through the rectum; but in other instances through the vagina, as there is less danger of hemorrhage from the vaginal bloodvessels. Should a fibrous or polypus tumor be punctured, from an error in diagnosis, no great harm will be done. Great care, however, must be exercised in the examination of fluctuating tumors, especially when they are toward the pubic side of the pelvis, as the bladder may prolapse and present a fluctuating tumor, and which must not be punctured under ordinary circumstances.

If the tumor be solid, and cannot be pushed up above the brim, or if the means previously employed fail to lessen its size, the delivery should be effected by the forceps, in all cases where it is possible; but where this can not be done, the only resource left is embryotomy, extracting the brain, and, if required, the contents of the chest and abdomen; unless, indeed, the physician is willing to subject the mother to the hazard of the Cesarean operation, or the extirpation of the diseased mass.

Dr. Merriman has recorded the history of eighteen cases of ovarian tumors impeding labor, in which nine mothers died, three recovered very imperfectly, and six escaped; of the children, fifteen were still-born, and three were born alive. He states: "*Twice*, the labor was effected by the pains, unassisted by the art of the accoucheur; but one of these women lost her life, and one of the children was still-born. *Five* times the perforator was used, after a longer or shorter duration of labor: three of these women died, another recovered very imperfectly, and one got well. *Five* times the labor was terminated by turning the child; all the children were lost, and only one mother recovered. *Three* times, the tumors having been opened, the labor was afterward trusted to nature; two of these women recovered, but the other remained f
long time in an ill state of health; two only of the children wer
served. In *three* cases, the tumors having been opened, it
found necessary to have recourse to the perforator; one of th
died, one remained in an ill state of health for eighteen
then sank under her sufferings; the third recove

whole," Dr. Merriman observes, "the evidence we at present possess, is more in favor of opening the tumors when they contain a fluid, than of any other mode of procedure; for of the nine women who recovered more or less perfectly, *five appear to owe their safety to this operation*, and of the children born alive, two were preserved by the same means."

In all these cases, the time of the operation must be determined by the constitutional symptoms, never delaying assistance after symptoms of powerless labor have commenced. The danger, in these tumors, arises, not so much from the obstruction to the labor, as from the influence exerted upon the disease itself; the pressure upon the tumor, and its consequent irritation, together with the debility, or exhaustion of the patient, occasioned by the prolonged and painful parturition, render her unable to sustain the effects of the irritation and nervous shock after the conclusion of the labor.

Other tumors may be present as impediments to the progress of labor, as FUNGOUS, or CAULIFLOWER TUMORS, which, from their spongy character and tendency to hemorrhage, may be mistaken for a placenta prævia; these may spring from either lip of the cervix, and when small, may allow the birth of the child without any artificial aid. But when large, they may have to be incised, or entirely removed by excision; in either case, there will be but a slight chance for the mother's recovery. Embryotomy and gastrotomy have both been performed in these cases, but generally, with fatal results.

ENCYSTED TUMORS, may adhere to the cervix uteri, or to the vaginal walls; they are usually round, well-defined, movable, elastic, and sometimes fluctuating, and require the same treatment as heretofore named for other tumors, as do also those of a *Scirrhous*, or *Phlegmonous* character, *Polypi*, and various *Excrescences*, and *Syphilitic Vegetations* which may be found on the external parts of the generative organs.

From the great fatality which attends the presence of pelvic tumors, as obstacles to delivery, it must be regarded as a fortunate matter that their occurrence is not very frequent. Perhaps, less fatality would attend these cases, when known at an early period, and both mother and child be saved, were the induction of premature labor accomplished; although, it is by no means improbable, that even at the seventh month, instances may be met with which will offer an obstacle to the operation, and with these, the production of an early abortion affords the only chance of safety for the mother.

As a general rule of action, in all cases of tumors at full term, the first attempt of the practitioner should be to push the tumor up above the superior strait, beyond the head, so as to remove its interference with the advance of the latter. And the operator will be more likely to succeed by placing the patient on her knees, with the pelvis elevated, and the breast on the bed, in a line with the knees; this position deprives the patient of any tenesmic, or bearing down power, beside causing the uterus to gravitate further from the pelvis, in a direction toward the epigastrium, and thus affording greater space into which the tumor may be placed. The manipulation may be conducted according to circumstances, with the hand in the vagina, or one or two fingers in the rectum, or both combined.

Where the tumor cannot thus be placed out of the way, it is recommended to puncture it with a trocar, and in case this fails, to perforate the child's head, either of which operations do not always lessen the danger to the mother. In relation to puncturing or incising the posterior vaginal wall, in these tumor cases, Prof. Meigs remarks in his valuable work on Obstetrics, "I do not feel at liberty to recommend such an operation in this volume—an operation which could only be legitimately performed, upon due and mature consideration with the most acute and able practitioners of the vicinity. They alone should feel themselves vested with the authority to act under such terrible circumstances. I merely remark, *en passant*, that an incision into the posterior wall of the vagina, should it even have the good effect sufficiently to reduce the size of the tumor, fearfully exposes the patient to the risk of vaginal laceration from the subsequent distension by the descending head, and the escape of the child into the peritoneal sac. A small aperture in the thin posterior paries of the tube, is more likely to yield and become a frightful laceration, than to resist the distending force of the advancing head." These remarks, from one of the most eminent accoucheurs of America, are entitled to the serious consideration of every medical man. Up to this period, I have met with only one instance of tumor offering an impediment to delivery; it was a cauliflower excrescence of the cervix, in a female with her fifth child, and terminated fatally.

DEFORMITIES OF THE PELVIS, are another cause of protracted and difficult labors, not unfrequently rendering the descent of the child impracticable, and are much more common to the women of Europe than to those of America. In Part I, I have referred to the character of these malformations, and the method of determining them; it now remains to speak of the management of labor when they are present.

The ABNORMALLY LARGE PELVIS, can scarcely be considered a deformity; but as the head of the child may meet with but little resistance in its passage through the canals, the various motions of flexion, rotation, etc., may not take place at all, or else be very imperfectly effected, and thus modify the labor. The consequences which may result in these kind of labors from deficient resistance, have already been named in Part I. Where the labor proceeds rapidly, the child may unexpectedly be expelled and fall upon the floor, even before the practitioner has deemed it advisable to make the usual preliminary preparations. In these cases, the best method of management, when called in time, is, to prevent the head from being too hastily expelled, by pressure upon it during a pain, giving firm support to the perineum until it is sufficiently yielding to allow the head to pass without causing a laceration, and to guard against hemorrhage by pressure over the uterine globe. After delivery, the patient should be kept in the horizontal posture, for a longer time than is usual.

The DWARFISH PELVIS, will offer an impediment to labor, according to the degree of contraction present; the labor may be accomplished by the natural powers, but it will be tedious, difficult, and attended with much suffering, and perhaps, from the long-continued compression of the head, result in the death of the child; or, it may be impossible for the child to be born without assistance. And, indeed, the same observations will apply to the *Unequally Contracted Pelvis,* and the *Obliquely Distorted Pelvis.*

The character of the labor, in these instances, will depend entirely upon the amount of deformity, which may be arranged as follows: 1st. Where the diminution of the pelvic diameters is not so great but that the child may be born, after a long time, by the natural powers, aided, in most cases, by the forceps, for the application of which there will be found sufficient space. 2d. Where the diminution of the pelvic diameters renders it impossible for the head to advance, and the forceps can not be applied for want of space, and, consequently, the only resource is the perforator. 3d. Where the pelvic canal is so reduced in size, that even a mutilated child could not be extracted.

The difficulty of the labor will not depend so much upon the positive size of the pelvic diameters, themselves, as upon their adaptation, relatively, to the diameters of the fetal head; for, though the pelvis may be considerably contracted, yet, if the child's head be small, the labor may progress with comparatively little difficulty. A pelvis, whose small diameter is less than three inches, may generally be considered as one through which a living child cannot pass; on this point, however, it may be proper to state, that accoucheurs vary in their estimate, some placing the limit at two inches, some at two and a half, and others at three, and even three and a quarter inches. In instances where the small diameter is less than three, but exceeds two inches, the labor will belong to the second arrangement or class, as given above; in such cases the forceps could not be employed advantageously, or if an attempt were made to use them, it would, undoubtedly, prove useless, and perhaps injurious — the perforator and crotchet, would be demanded here. Authors likewise vary in the limit of measurement in these labors requiring the mutilating instruments, some placing it at one and a half inches, and others at one and three quarters, and two inches. When the small diameter is below two inches, the labor belongs to the third arrangement, and will, very probably, require the Cesarean operation, before the child can be removed.

When there is a deformity of the pelvis, we are informed by Dr. Rigby, that the uterine contractions are frequently irregular during the first stage of labor, exerting but little influence in dilating the os uteri; the head remains high up, does not descend against the os uteri, and shows no disposition to enter the pelvic cavity—being pushed forward by the promontory of the sacrum, it rests upon the pubic symphysis, pressing forcibly against it. The mode of determining deformity at the superior strait, has been already explained in Part I. When the deformity is in the cavity or at the inferior strait, it is detected with much less difficulty, as the parts are more readily reached; we will discover that the head makes no advance during a pain, and if the finger be passed around during the absence of pain, the head will be found larger than the canal through which it has to pass.

When the labor is allowed to proceed without interference in these extremely deformed pelves, various symptoms may present, which are generally met with during the second stage, as: inefficient contractions, exhaustion, and febrile symptoms, inflammation and sloughing of the soft parts, the result of long and forcible pressure of the head, and which may occur at either of the straits, or in the cavity, and may, likewise, penetrate into the bladder, or rectum; rupture of the uterus not unfrequently occurs in these cases. The child may have one or more bones of the cranium fractured, or the pressure may cause inflammation or sloughing of the scalp, or its death may be occasioned by strong and continued compression of the head.

TREATMENT.—This will depend much upon the class to which the deformity belongs; if it be of the first class, a fair trial should be given to the natural powers, and if they be found insufficient to effect the child's expulsion, or if symptoms of exhaustion appear, assistance should be given with the forceps, provided there be space enough for their application. If the case belongs to the second or third class, I deem it advisable to operate at as early a period as possible, before the system of the patient has become exhausted from the long-continued exertion and sufferings of the labor, thereby materially increasing the chances of a favorable result. In instances where the perforator is indicated, the child is generally dead from the pressure, before the symptoms have arrived at a point demanding the operation. In all cases where deformity of the pelvis is suspected during labor, the practitioner should at once proceed by a careful examination to determine the character and location of the distortion, and the method of management should be decided upon only after a consultation with experienced accoucheurs.

The following extract from Dr. R. Lee's Lectures on Midwifery, relative to the treatment of pelvic deformities, will, no doubt, prove acceptable to the reader; he observes: "In cases of slighter distortion of the pelvis, it is impossible to predict at the commencement of labor whether the head will pass or not, and while it continues to advance and no unfavorable symptoms are present, you ought not to interfere—wait patiently and see what nature can do. If the head descends so low into the cavity of the pelvis that an ear can be felt, and the os uteri is fully dilated, and there is room to pass up the blades of the forceps without the employment of much force, it is always proper, when delivery becomes necessary, to attempt to extract the head with the forceps. It is necessary, however, to remember that sloughing is apt to follow the use of the forceps where the soft parts have been long pressed upon by the head, and that perforation of the head is a much safer operation for the mother, when the distortion is considerable.

"The employment of the long forceps, in cases of distorted pelvis, has been recommended by Baudelocque, Boivin, Lachapelle, Capuron, Maygrier, Velpeau, and Flammant, whose works contain ample instructions for its use, before the head of the child has entered the brim of the pelvis; and the last of these writers has expressed his belief that the instrument is more frequently required while the head of the child remains above the superior aperture of the pelvis, than after it has descended into the cavity.

"In this country there are no practitioners of judgment and experience, who have frequent recourse to the forceps, or who employ it before the orifice of the uterus is fully dilated, and the head of the child has descended so low into the pelvis that an ear can be felt, and the relative position of the head to the pelvis accurately ascertained. The instrument is very seldom used in England where the pelvis is much distorted, or where the soft parts are in a rigid and swollen state; but it is had recourse to, where delivery becomes necessary in consequence of exhaustion, hemorrhage, convulsions, and other accidents which endanger the life of the mother. It is used solely with the view of supplying that power which the uterus does not possess."

Again, "Where there exists a great degree of distortion of the brim of the pelvis, you may be unable to determine, positively, the distance between the base of the sacrum and symphysis pubis; and it is not necessary, for practical purposes, to do so with mathematical accuracy; but when it is under two inches and a half, you will readily discover, if you have had considerable experience, on making the ordinary examination, from the unusual manner in which the sacrum projects, that it is impossible for a child at the full period to pass through it. If labor has commenced at the full period of pregnancy, and you discover, before it has continued many hours, that the pelvis is greatly distorted, and that the child can not possibly pass alive, no advantage can result from allowing the labor to endure till the patient is exhausted, and you are satisfied that the difficulty can not be overcome by the powers of the constitution. In such a case delay is dangerous, and there is nothing which can save the woman's life but opening the child's head with the perforator, and extracting it with the crotchet. But this should never be had recourse to without a regular consultation of experienced practitioners, and before it has been placed beyond all doubt, by the most careful investigation, that the delivery can be accomplished in no other manner, so as to preserve the mother's life.

"In the greater number of cases of difficult labor from a high degree of distortion of the pelvis, which have come under my observation, where it has been the first child, the process has been allowed to go on till the efforts of the patient had been nearly discontinued, or had ceased entirely, and the favorable period for operating was lost. In some cases, even when the duration of the labor, and the local and constitutional symptoms, have made it manifest that such interference was justifiable and necessary, I have unfortunately delayed too long to deliver, in consequence of employing the stethoscope, and ascertaining that the child was alive. In cases of extreme distortion of the brim of the pelvis the proper practice is, to perforate the head as soon as the os uteri is sufficiently dilated to admit of the operation being done with safety, and afterward leaving the patient in labor till the head has partially entered the brim, and the os uteri is considerably dilated. There can be no doubt that, in some cases, it is right to interfere before we certainly know that the child has been destroyed by the pressure; but we have nothing here to do with the question respecting the life or death of the child; our conduct will be biased if we endeavor to solve this question. We have only to determine, positively, that delivery is absolutely necessary to save the mother's life, and that it is impossible for the head of the child to pass, till its volume is reduced. Paré, Guillemeau, Mauriceau, Portal, Puzos, Levret, Smellie, and all the best accoucheurs who have since appeared in Britain, have performed the operation of craniotomy in many cases of distortion from rickets and malacosteon, without reference to the condition of the fetus. 'True religion and the common sense of mankind,' observes Dr. Denman, 'appear to have nothing contradictory. The doctrine they teach, of its being our duty to do all the good in our power, and to avoid all the mischief we can, is applicable to the exigencies of every state, and we may be easily reconciled to it on the present occasion. In some cases of difficult parturition, it is not possible that the lives, both of the mother and child, should be preserved. Of the life or death of the mother, we can, under all circumstances, be assured: of the life or death of the child, there is often reason to doubt, when we are called upon to decide and to act. The destruction of the mother would not, in the generality of cases which may bring the operation of which we are speaking under contemplation, contribute to the preservation of the child; but the treatment of the child as if it were already dead, with as much certainty of success as is found in other operations, secures the life of the parent. It then becomes our duty, and is agreeable to our reason, to pursue that conduct which will give us the most probable chance of doing good; that is, of saving one life, when two lives cannot possibly be preserved.'

"'The only means of effecting delivery,' observes Dr. Collins, 'where the disproportion between the head of the child and the pelvis is so great as to prevent us reaching the ear with the finger, is by reducing the size of the head and using the crotchet. This is, however, an operation that *no inducement* should tempt any individual to perform, except the imperative duty of saving the life of the mother when placed in imminent danger. I have no difficulty in stating, that after the most anxious and minute attention to this point, that where the patient has been properly treated from the commencement of her labor; where strict attention has been paid to keep her cool, her mind easy; where stimulants of all kinds have been prohibited, and the necessary attention paid to the state of the bowels and bladder; that, under such management, the death of the child takes place in laborious and difficult labor before the symptoms become so alarming as to cause any experienced physician to lessen the head. This is a fact which I have ascertained beyond all doubt by the stethoscope, the use of which has exhibited to me the great errors I committed before I was acquainted with its application to midwifery, viz: in delaying delivery, often, I have no doubt, so as to render the result precarious in the extreme, and in some cases even fatal.'

"The operation of craniotomy is now performed by all British practitioners of reputation, whether the child be alive or dead, if the condition of the mother is such as to render delivery absolutely necessary, and the head of the child is beyond the reach of the forceps, or where, from distortion of the pelvis, or rigidity of the os uteri and vagina, it cannot be extracted if its volume is not reduced. This operation is performed from a conscientious belief and deep conviction that if neglected to be done at a sufficiently early period, the mother's life will be sacrificed, and the life of the mother is considered to be much more important than that of the child. Some continental writers affirm, but I believe unjustly, that in England we have frequently recourse to craniotomy without due consideration, and without proper regard to the life of the child; and, whatever the state of the parent may be, they refuse to open the head till they can obtain certain evidence, which, in some cases, it is impossible to obtain, that it is dead. 'Nothing could excuse the conduct of the practitioner,' says Baudelocque, 'who would perforate the head of a child without previously knowing with certainty that it was not alive, a circumstance which can only authorize us to employ the perforator and crotchet.' By following this erroneous principle, the lives of both mother and child would, I believe, in the majority of cases, be sacrificed."

The operation of *turning* has been recommended, in cases of pelvic deformity, by some authors: I consider the operation a very hazardous one, which cannot be too strongly censured, even when undertaken in the slighter degrees of distortion. It is impossible to tell how the diameters of the head may compare with those of the pelvis; and, in turning, the head may be so placed as not only to expose the female to the pains and difficulties incident to the operation, but to the subsequent difficulties attending the employment of the forceps, or perhaps the perforator, one of which will most certainly be required; beside affording not the least chance for the safety of the child.

After delivery, every means should be employed to guard against sloughing: warm water, or an infusion of St. Johns-wort, should be injected into the vagina two or three times a day; or an injection of Elm bark and Arnica flowers may be used. Febrile or inflammatory symptoms may be combated with the tincture of Gelseminum; or the following powder may be administered:

Compound powder of Ipecacuanha and Opium, half a drachm; Sulphate of Quinia, six grains. Mix together, and divide into six powders, of which three may be given daily, at intervals of four or five hours.

In all instances where a deformity of the pelvis is known to exist, and especially when from careful measurement, or the results of a previous labor, it is ascertained that a living child cannot be born at full term, the induction of premature labor should be unhesitatingly performed; likewise, in cases where the life of the mother would be endangered from the difficulty or impossibility of delivery at this period. And in those cases where, at the seventh month, premature labor would be hazardous to the mother, on account of excessive diminution of the pelvic diameters, or distortions, I should not hesitate a moment in adopting measures to produce abortion.[°]

[°] The following excellent observations are extracted from "Murphy's Lectures on Natural and Difficult Parturition," London edition, 1845, and are well worthy the attention of the student and practitioner. I have purposely omitted his Notes.

"It is hardly necessary to state to you that there is every variety in the degree of disproportion between the head and the pelvis. In some instances it is so slight that the child may be safely delivered without any assistance; only it will occupy a longer time in passing through the pelvis. In others, the amount of difficulty may be so much increased as to render it doubtful whether the head can pass without assistance; and it is in these cases that the rules which are given for your guidance are the most contradictory. Again: you may have a still greater disproportion, in which there is no doubt about the improbability that the head can be expelled by the natural efforts of the uterus, although there is very great doubt, and no little dispute, as to the means by which the head must be extracted. Lastly: you have occasional instances in which the narrowness of the pelvis is such, or the magnitude of its distortion is so great, that the safe delivery of the child is hopeless: the head must be lessened; it must be destroyed before it can be brought into the world. In extreme cases of this kind, even this cannot be done; but recourse must be had to the difficult and dangerous operation of removing the child from the uterus by laying it open, in order to save the mother from the dreadful alternative of dying undelivered.

"In those cases of slight deviation from the standard pelvis, where there is every evidence of space sufficient for the head ultimately to pass through the pelvis, if nature be allowed time for the purpose, you would not, of course, interfere with her; although I believe instances might be quoted where *very adroit operators* have, even in such cases, relieved the tedium of a long attendance by a ready application of the forceps. It is sufficient to say, that the united testimony of the profession, given in every standard work of midwifery, is opposed to such a practice; and if any accident should arise from this mischievous meddling, the operator is fully responsible for all the consequences that follow from it. But in those more doubtful cases, in which there seems hardly sufficient space for the head to pass safely through the pelvis, the practice is not so clear, nor is the evidence of the profession so unanimous on the subject. When, in such instances, the head is actually arrested, and so remains for some hours in the same position—a icient length of time to satisfy you that the uterus cannot advance it—if the ear can

My colleague, Prof. C. H. Cleaveland, has given to me the following account of two instances of injury to the coccyx, occasioning deformity at the inferior strait, and his mode of management. "Mrs. S., about

---

be felt, or the finger be passed easily between the head and the pubis, you may use the forceps to deliver the child, and I think the weight of authority will support your practice. But when the head is not so arrested, but, at the same time, advances so extremely slowly that it seems to be arrested, you have here the discordance of authorities at once confounding you. Burns devotes the greater part of a chapter to prove the impropriety of delay under such circumstances, and advocates the application of the forceps in cases of arrest, or rather of slow progress of the head, because 'in such cases then we may experience much evil from trusting too long to nature, but add little to the sufferings of the patient, and nothing to her hazard, by instrumental aid.' He applies the same principle to cases of impaction, which we shall presently consider. The evil he dreads is uterine exhaustion, if this second stage be much prolonged. In this view he has the support of the late Professor Hamilton, who equally dreaded delay. Dr. Campbell also gives a similar opinion, but more guardedly expressed. 'It may, however, be repeated, that while the delivery is advancing, and the patient continues free from unfavorable symptoms, the use of the forceps is to be abstained from altogether. *But whenever the progress is slow and imperceptible*, and the subordinate means already recommended have failed to accelerate the transit of the fetus, the case should be watched, and *this instrument applied with very little delay after the passages are prepared.*' Other names might be added to this list of advocates for interference in the case supposed. But let us turn to the other side, and you will find the eminent names of William Hunter, Osborne, and Denman, opposed to this practice. Dr. Osborne would wait until exhaustion had actually taken place—a maxim for which he has been very severely, and I admit, very justly criticised. Dr. Denman's fifth aphorism states, 'It is meant, when the forceps are used, to supply with them the insufficiency or want of labor-pains; but *so long as the pains continue*, we have reason to hope they will produce their effect, and *shall be justified in waiting*.' When the pains cause the head to advance, although very slowly, they are producing their effect; and the case therefore comes within the limits of the aphorism. Dr. Collins observes, 'Let it be carefully recollected at the same time, that so long as the head advances EVER SO SLOWLY, the patient's pulse continues good, the abdomen free from pain on pressure, and no obstruction to the removal of urine, interference should not be attempted, *unless the child be dead*.' Dr. F. Ramsbotham's third rule on this point is, 'If the head advances at all, and be not impacted, provided the strength and spirits are good, there is seldom need to interfere.' Dr. R. Lee's name might also, I think, be added, as being favorable to this rule of practice.

"I shall not, gentlemen, so far trespass on your patience as to ask you to unravel with me this tangled web of contradictory experience. It is sufficient if I convince you of the difficulty of the subject, and if it induce you to give a patient attention to the only mode that I can adopt to draw a legitimate conclusion—that is, to derive it as nearly as possible from facts, without reference to opinions. I think this may be done. Bearing in mind that the great and leading principle to be observed in these difficult cases is, to preserve both mother and child, if possible, from injury, I think it is in our power to compare the results of cases where the forceps has been applied with those where it has been withheld, and thus determine the practice which presents the greatest success. We shall first direct your attention to the following tables of operative midwifery, derived from reports given by British and foreign practitioners; you will find in them the total number of cases given by each, the number of forceps operations, and the results to mother and child when they are given.

to be confined with her first child, informed me, that, while walking over an icy, but rough piece of road, some years previously, she fell suddenly in a sitting posture, and either fractured or dislocated the os

COMPARATIVE VIEW OF FORCEPS OPERATIONS AND PERFORATIONS.

BRITISH REPORTS.

Date.	Place.	Name.	Total Cases.	Forceps.	Deaths.		Perfo-rati'ns	Deaths: Mothers	Total Opera-tions.
					Chi ren.	Mothers.			
1781.......	London....	Dr. R. Bland....	1,897	4	—	—	8	—	12
——	Do.	Dr. Merriman...	2,947	21	6	—	9	—	30
1828 to 1843	Do.	Dr. F Ramsboth.	35,745	49	11	3	38	6	87
1787 to 1793	Dublin	Dr. J. Clarke ...	10,387	14	—	2	49	16	63
1826 to 1833	Do.	Dr. Collins	16,414	24	8	4	79	15	103
1835 to 1837	Do.	Dr. Beatty......	1,182	9	4	—	3	—	12
1835 to 1840	Do.	Dr. Churchill ...	1,640	3	1	—	12	1	15
1832 to 1835	Do.	Dr. Murphy	5,699	14	5	1	29	6	43
			75,911	138	35	10	227	44	365
	London....	Dr. R. Lee......	—	55	38	9	127	23	182

FOREIGN REPORTS.

FRENCH.

1797 to 1811	Paris......	Boivin	20,357	96	23	—	16	—	112
1812 to 1820	Do.	La Chapelle	22,243	77	18	—	12	—	89
			42,600	173	41	—	28	—	201

GERMAN.

1821 to 1825	Wurtemb'g	Riecke	221,923	2,740	636	127	98	35	2,838
1801 to 1821	Vienna ...	Boër...........	26,965	100	—	—	43	—	143
1797 to 1827	Ghent.....	Jansen.........	13,365	341	—	—	5	—	346
1811 to 1827	Prague....	Moschner.......	12,329	120	—	—	4	1	124
1825 to 1827	Bonn......	Kilian	9,392	120	—	—	4	—	124
1814 to 1827	Dresden ...	Carus..........	2,549	184	—	—	9	—	193
1817 to 1828	Berlin.....	E. Siebold	2,093	300	—	—	1	—	301
1823 to 1827	Do	Klugè..........	1,111	68	14	—	8	3	76
	Heidelberg.	Nægèle.........	1,711	55	—	—	5	—	60
			291,438	4,028	650	127	177	39	4,205

"You will perceive that in these tables the number of forceps operations in British practice is 138; in thirty-five of which the child was still-born, being in the proportion of one in every fourth case. In order to prevent error in this proportion, we have separated Dr. Lee's forceps cases; the total number of which given by him is fifty-five; the mortality of children, thirty-eight; which would be quite out of proportion (being more than one-half) if these cases were not carefully examined. I have endeavored to do so, and to make the necessary corrections. In nineteen of these fifty-five cases, the forceps failed: they therefore became cases for perforation; of the remaining thirty-six cases, one-half the children, eighteen, were lost, but twelve of these eighteen were destroyed by other causes than the forceps. Deducting, therefore, all such cases from the whole coccyx, or fractured the lower part of the sacrum, probably the latter, as the bone projected so far toward the front as to cause the feces to be expelled in a forward direction, and near the external orifice of the

---

number, the remainder will be twenty-four forceps cases, in which eighteen children were saved and six lost, being in the same proportion, one in four.

"In the French reports, forty-one children were lost in 173 forceps operations, being one in four, nearly.

"In the German reports of Riecke and Klugè, which state the mortality of the children, the number of their forceps operations united is 2,808; the deaths of children, 650; being also one in four, nearly. Thus, then, we may conclude, that one-fourth of the children delivered by the forceps are lost. What is the result when these protracted cases are left to themselves? Is the mortality increased? I do not think such will be found to be the case. In order to determine this question, I must refer you to Dr. Collins's valuable report—the only report which, from its extreme accuracy and minuteness, affords the elements upon which to form a calculation. Dr. Collins has given tables to show the duration of labor in all the cases he reports; he has also given separate tables to show the duration of labor in forceps cases, and in those which were preternatural. We may also assume, that perforation being only had recourse to 'when, after the most patient trial, the impracticability of labor being terminated in safety by any other means was clearly proved,' that all these cases exceeded twenty-four hours. From these data, then, we shall endeavor to draw a fair conclusion.

Cases of Labor protracted to 24 hours and upw'rd from Dr. Collins's Report.

TOTAL CASES, 430.		STILL-BORN CHILDREN, 150.		MOTHERS DEAD, 40.	
Delivered by forceps	12	Still-born	4	Mothers dead	0
by perforating...	79	Do.	79	Do.	15
preternaturally ..	15	Do.	6	Do.	0
naturally........	324	Do.	61	Do.	25
	430		150		40

"From this table you perceive, that of 430 cases in which labor lasted twenty-four hours or exceeded it, 324 of them were natural cases, delivered without assistance, and that of these 324 the children were lost in sixty-one instances, which would be about one in five cases. The result of my own inquiries on this subject is nearly similar, and has been obtained from the same source, the Dublin Lying-in Hospital.

Report of 218 *cases of Labor protracted to or beyond* 24 *hours.*

Delivered.	Cases.	Boys.			Girls.			Mothers Dead.	Causes of Mothers' Death.
		Living	Dead	Putrid	Living	Dead	Putrid		
By forceps	14	4	1	—	5	4	—	4	1 Puerperal fever. 1 Rupture of uterus.
By perforations....	29	—	20	1	—	7	1	6	1 Puerperal fever. 1 Rupture of uterus.
Naturally.........	175	76	19	5	52	22	1	8	3 Puerperal fever.
	218	80	40	6	57	33	2	18	

vagina. She mentioned this condition of the parts as a probable source of difficulty in the labor.

"On making an examination, I found that the bone pressed forward,

---

"In 5,699 cases, 218 were protracted to this degree; and of these, 175 were delivered naturally, and forty-one children not putrid were still-born, being one in four, nearly. Thus, then, you perceive that, taking the widest, and, we would say, the fairest view of this question, the proportion of still-born children in these difficult and protracted cases is nearly the same, whether the forceps be employed or otherwise; that the difference, if any exist, is in favor of Dr. Collins's practice of leaving these cases to nature. But this is only one view of the question.

"It may be said, and has been said, in the energetic language of Dr. Burns, that the mother must be considered. 'From the strength of the recommendations of the partisans of nature, we should suppose that whenever the child could actually be born without aid, no hazard occurred; and, on the other hand, that instruments must of necessity prove not only very painful in their application, but dangerous in their effects. Now, the first supposition is notoriously wrong, for *innumerable instances* are met with, where the mother does bear her child without artificial aid, and much doubtless, to the temporary exultation of the practitioner, but, nevertheless, death takes place, or at the best, a tedious recovery is the consequence.' Is such the case? It is totally opposed to my personal experience; on the contrary, I have been surprised at *the rapid* recovery of patients who have suffered this protraction, when I had erroneously anticipated, from that very circumstance, all the unpleasant consequences here detailed. But I would again ask you to put aside, for the present, individual experience, and examine the facts. In doing so, our data are more limited than those which assisted us in the former question, because, in the French reports, there is a most ominous silence regarding the mortality of the mothers—they say nothing about it. In the German reports, we are limited to that of Dr. Riecke, who gives 127 deaths in 2,740 cases, being one in twenty-one, nearly. But take Dr. Churchill's more extensive researches on this question, from whose valuable work on operative midwifery these tables of foreign practice are partly formed. He states, that 'among the French and Germans, in 479 cases, thirty-five mothers were lost, or about one in thirteen.' Dr. Churchill gives the proportionate mortality in British practice as one in twenty-one; but you perceive that, in the comparative view we have placed before you, there were ten deaths in 138 cases, which is about one in thirteen. Compare this with the result where the cases have been left to the natural efforts. In Dr. Collins's report, there were twenty-five deaths in 324 cases, or one in thirteen, precisely the same as where the forceps had been used. Among those cases which I have observed, there were eight deaths in 175 cases, or one in twenty-two—a proportion in which I can place the more confidence, because it is derived from personal observation.

With regard, then, to the second question, the mortality of the mother, take the estimate in any way you please, and you must arrive at the same conclusion—viz: that the mortality is certainly not increased when these cases are not interfered with, and all the dreaded consequences which Dr. Burns anticipates from such practice have no foundation in fact. But we might even go farther; we might say, that so far from such evils following our Fabian practice, the evidence seems to point the other way, and to prove that the actual mortality is diminished. The twenty-five deaths reported by Dr. Collins include cases of puerperal fever, and other causes of death which might be called accidental, because he gives, under a distinct head, the number of deaths, the 'effects of tedious and difficult labors.' These are just eleven cases, or one in thirty cases, nearly. The eight deaths which took place under my own observation, include three deaths from puerperal fever, leaving only five deaths from the severity and protraction of labor, which in a direction nearly or quite horizontal when the patient was standing erect, and was at least two inches long from its angle of juncture with the sacrum, at which point it was firmly anchylosed. Judging it im-

---

would be in the proportion of one to thirty-seven cases. Caution, however, is necessary, when we would derive a just conclusion from statistics. It is therefore possible, that if the reports of these forceps operations were more fully given, so as to separate the deaths from accidental causes from those resulting from the operation, the proportion of mortality would be diminished in the same ratio. We do not wish you to assume more than what we think has been proved—viz: that the mortality of the mothers is not increased by leaving these cases to nature. The safety of the mother or child can not, therefore, be advanced as a reason for instrumental delivery, when the head is making a very slow but a certain progress.

"One argument, however, has been much used by the advocates for interference, which is very clearly expressed by Dr. Burns: 'Granting (he observes) the recovery to be excellent, is it no consideration that the patient has been subject to twelve, perhaps twenty-four, hours of suffering of body and anxiety of mind, which might have been spared?' You must perceive that if this argument be worth anything, it will admit of a much more extended application than Dr. Burns would give to it. It might be employed to justify the use of the forceps in every case where the head was within reach, and labor at all severe. Because, why should your patient be exposed to *any* bodily suffering or anxiety of mind, if it were in your power to relieve her from her miseries? On this principle, the forceps might be used (as indeed they have been) in every tenth case, and the practitioner relieved from the most anxious portion of his duties. But the design of nature will not thus be thwarted; and we might reply to such an argument in the language of Naegèle: 'If we admit that proportionate difficulties, according to the constitution of each individual, and an effort of strength (requisite in childbirth), are inseparable from the nature of this process, we must conclude *that an abbreviation of this process, though performed by an able hand,* before the salutary change, on which the preservation of health depends, has taken place in the organization of the mother, that a premature and sudden removal of these difficulties can not be a matter of indifference; that such a violent interference with the functions of nature must incur the risk of destroying the health, though this should not ensue for some time after.' A more immediate injury, however, sometimes follows the application of the forceps in the case we are supposing, as well as in cases of impaction. The pressure of the instrument may cause slough of the neck of the bladder or the urethra, and thus establish a fistulous opening into the vagina; and the incontinence of urine that follows renders the patient's life miserable afterward. It is difficult, in all instances, to trace this accident to the use of the forceps. When a forceps operation is described to us, we are seldom told that any mischief is the consequence. The splendor of success is very dazzling, and while we admire the operation, we are too often left in the dark as to the effects. Nevertheless, I have been able to trace this accident clearly to the use of the forceps in several instances. The usual account given by the patient is, 'that she had been delivered by instruments, and the child's life saved.' Dr. R. Lee, in his 'Clinical Reports,' gives a candid and clear statement of the results in the forceps cases he details: 'Four died from the rash and inconsiderate use of the forceps; seven had the perineum more or less injured; one had the recto-vaginal septum torn; five were left with cicatrices of the vagina, after sloughing; and one with incurable vesico-vaginal fistula.' Dr. Collins records only *one case* of vesico-vaginal fistula in the whole of his report of 16,654 cases—that was a case of perforation—consequently this accident never was found among those cases which were delivered naturally. The only case of fistula which occurred in the 5,699 cases to which I have so often possible for a full grown fetus to pass through the narrowed passage, I explained the nature of the difficulty, and the proposed mode of removing it. With her consent, I passed both my thumbs up the rectum and

---

referred, was one in which I employed the forceps to deliver a child that presented the forehead. The principal cause of difficulty in Dr. Collins's cases, was the large head of the male child forcing its way through a very osseous pelvis; the pressure on the soft parts must be very great, and if fistula could be produced by great protraction of labor in cases that ultimately were delivered without assistance, it must have been an accident of frequent occurrence in these cases, when the soft parts were so much compressed; but such did not happen, and therefore they afford a very favorable contrast to the cases delivered by the forceps in nearly similar circumstances. The intelligent practitioner would therefore hesitate to expose his patient to the risk of vesico-vaginal fistula, for the mere gratification of shortening the severities of labor.

"We have been reluctantly compelled to dwell longer upon the management of this degree of disproportion than we desired. The difficulty of the question it involves, and the contradictions among the most experienced writers, must be our apology. In the case that we are considering, that in which the second stage of labor is protracted, and the head of the child advancing *very slowly*, we have shown you that there is no increased danger to the mother or child by leaving the case to nature in place of delivering by the forceps; that if there be any difference in the ratios of mortality, it is in favor of non-interference, and rather against the forceps. We have pointed out, as far as imperfectly detailed facts would enable us, that the post-partum accidents of labor follow operations with the forceps more frequently than cases which are left to themselves, and, consequently, the conclusion at which we must arrive, is hostile to the use of that instrument, under the circumstances stated. But recollect, that there is no general rule without an exception, and you will sometimes meet with cases so feeble in their habits that they will not endure a protracted labor without great risk of exhaustion; you may be called to patients where you dare not temporize, whom you must deliver although the head is making a tardy progress. We only ask you to consider these as the exceptions, not often met with, but still necessary to be studied and understood. It is for this reason we have brought before your notice the symptoms of exhaustion, and those which precede it; the same desire to direct your attention to the study of individual cases which may be exceptions to the general principle, we would wish to govern you, leads me to bring before you the varieties, not only in the formation, but in the resistance of the pelvis, so that you may know where an operation might be undertaken and where it can not be attempted. If we have placed this subject before you with sufficient clearness, we shall conclude by directing your attention to that opposition in the practice of experienced authorities which has rendered its discussion so necessary.

Name.	Total Cases.	Forceps.	Proportion, 1 in	
Ramsbotham	35,745	49	729½	London.
Clarke	10,387	14	742, nearly.	Dublin.
Collins	16,414	24	684, nearly.	Dublin.
Boivin .... Lachapelle.......	42,600	173	246	Paris.
Boër	26,965	100	269½	Vienna.
Kilian	9,392	120	78	
Carus	2,549	184	14	Dresden.
Siebold............	2,693	300	9	Berlin.

Ramsbotham, one forceps operation in 700; Seibold, one in nine cases!

* * *

placed them on the internal part of the protruding bone, while my closed hands were upon its extérnal part. By making all the effort my strength and position would allow, I succeeded in breaking the bone at

---

"The management of cases where the head of the child becomes impacted, has been, I regret to say, almost as much a question for controversy as that which we have just discussed. It is admitted that the child must be delivered by the resources of art, but how these resources are to be applied is the matter in dispute. Some consider that even in these cases the forceps, skillfully employed, may effect the object in view; the woman may be thus delivered, and possibly the child preserved. Others dread such application of the instrument, because of the injury that may be done to the passages, and consequently they esteem the probable danger to the mother to be a risk too great to encounter for the very slight chance of saving the child. Hence the question lies between perforation of the head of the child and its forcible extraction by the forceps.

"It would be most desirable to determine the rule of practice in these very difficult cases, by an application of the same principle that was proposed to you in the last lecture. If we could compare such cases as have been delivered by the forceps when the head was impacted, with those in which recourse was had to perforation, if we could contrast the results, we might be able to arrive at a conclusion that would satisfactorily resolve our doubts upon the subject; but, unfortunately, that is impossible. We have no statistical knowledge of the effect of the forceps in these special cases; and the mortality that is reported under the head of perforation seems to be disproportionately increased by the circumstances under which the operation has been generally performed.

"From the earliest period, the profession have been accustomed to look upon craniotomy with dread—I might almost say, with horror. A natural reluctance to destroy human life, no matter under what necessity, has been greatly increased in some countries by religious prejudices; and the anathema of the doctors of the Sorbonne still exerts an influence that paralyzes the judgment of the practitioner. Hence we read of cases allowed to remain several days in labor, until not only the death, but the putrefaction, of the child, gave evidence that the perforator might be employed without any stings of conscience. The result of such practice was, as might be supposed, inflammation of the passages, advanced to such an extent that the mother was sacrificed to this procrastination; and hence in the tables of mortality we find that *one mother in every five*, and sometimes *one in every four*, died after the operation. We cannot, therefore, determine the rule of practice by statistical returns. We must only hope to do so by a fair examination of the question itself, by collecting the general experience of the profession, and by submitting to you the ground upon which we have formed the opinion which would govern us as to the course to pursue. We do not wish you to adopt this opinion unless you are satisfied of its correctness; we but ask you to examine the subject dispassionately, and to discard from your minds the damnatory language that too frequently is employed by some obstetric authors. When you find an operation spoken of as 'murderous,' you are not disposed to become the murderers: you doubt and hesitate, and perhaps ultimately commit a *double homicide*. An appeal to harsh expressions is generally esteemed an evidence of weakness in argument; therefore, when you find these hard words, you can appreciate their value, and pass them by for more conclusive reasoning.

"In order to compare the forceps and perforator in the case supposed, you must view the forceps as something more than a substitute for power of the uterus. In order to extract the head, it must also lessen its dimensions; it must be employed for the purpose of *compression* as well as for *extraction*. When we come to examine the different instruments used, you will find, in the varieties of the forceps, that some are shaped its angle, and pushed the lower portion considerably backward. This caused very severe pain for a short time, but left the parts so that delivery occurred without any difficulty, and she readily and perma-

---

especially for this purpose, which is sedulously avoided in the construction of others—a sufficient proof of want of unanimity on this important subject. Let us, then, examine the forceps as an instrument for compressing the head of the child, so as to adapt it to the diminished space in the pelvis.

"We have already evidence before us to prove that the power of the forceps for this purpose is extremely limited. The experiments of Baudelocque are referred to in almost every popular work on midwifery, and, notwithstanding the critical objections raised against them, they are sufficiently important briefly to state them to you. Being desirous to determine the extent to which the forceps could compress the head, Baudelocque performed nine experiments on the heads of still-born children with Levret's forceps, an instrument of the strongest kind, and especially adapted for compression. The utmost force was exerted to reduce the head—a force so great as to bend one forceps, although highly tempered: the head was not lessened more than two lines, unless where the bones were unusually soft and loose, and then only to four lines. These experiments satisfied Baudelocque that the diminution could not be, in any case, so much as accoucheurs had stated, and that the degree of reduction should never be measured by the distance between the handles when pressed together, nor from the amount of force employed to approximate them.

"In these experiments more force was used than you could venture to exert if the child were living, and yet the space gained was scarcely sufficient to admit the blades of the instrument to be introduced within the pelvis. They seem to me, therefore, conclusive as to the limited power of the forceps when used as a compressing instrument. Nor can I agree in the opinion of Dr. Rigby, that 'the slow and gradual pressure of the forceps, thus exerted [by tying the handles tightly together, and tightening them after every successive effort] upon the head of a living fetus, will have a very different result to that of the experiments of Baudelocque and others, in attempting to compress the head of a dead fetus by the application of a sudden and powerful force.' It is impossible to grasp the forceps for the purpose of moving the impacted head, without applying to it a sudden and powerful force; and if this force be maintained in the interval of the pains by ligature, such powerful, constant, and at the same time unequal pressure, acting on the head of the child, would appear to me much more hazardous than even the compression of the contracted pelvis, which is known to be a frequent cause of the child's death.

"The possibility, therefore, of reducing by the forceps the impacted head to that degree that will enable you to draw it safely through the pelvis, seems to me extremely doubtful. If it were the large head of the male child, advanced in its ossification, and wedged in the deep, narrow cavity of the masculine pelvis, I would say it is impossible. The only case where it might, perhaps, be successfully attempted, is in the diseased pelvis, which may be capable of some degree of expansion, and where the head of the child, being less ossified, is softer and more compressible.

"Let me now direct your attention from the child to the mother; and admitting it is possible, and only possible, to save the former, let us inquire into the risk to which the latter is exposed, in the attempt to accomplish this object. The very nature of the case implies an unusual degree of pressure on the soft parts between the head and the pelvis: congestion must be the result: and if inflammation have not already taken place, the passages are in such a state that inflammation could be most easily excited. The blades of the best contrived forceps cannot be applied to the head when it is tightly impacted in the pelvis, without bruising the soft parts to a certain extent. This contusion becomes nently recovered: about two years subsequently, she was delivered of a second and large child, without any trouble from the coccyx, or sacrum.

"About six years since, I was called to attend Mrs. A., who, her

---

a center around which inflammation takes place, may increase to any extent, and terminate either in a local slough of the compressed part, or a general gangrene of the vagina, if the inflammation assume an erysipelatous type. In the former case, the separation of the slough may be the formation of vesico-vaginal fistula. In the latter, death may be the result. You will admit that such consequences are of too grave a nature to hazard for the *slight chance* of saving the child, and therefore, when you are placed in the unpleasant alternative, either to save the child at the risk of the mother's life, or to sacrifice the child in order to preserve her, you must adopt the maxim which governs British midwifery, and consider the safety of the mother to be your first object. But you will seldom be placed in such a dilemma, if you observe closely a case of this description. If you are satisfied that the forceps cannot be safely introduced; if you think that you cannot compress the head sufficiently to extract it without exposing your patient to a tremendous hazard; it does not follow that you must destroy the child in order to deliver her. In the great majority of such cases, nature provides against the difficulty of the case by doing so herself. When the head is thus wedged, the liquor amnii discharged, and the uterus strongly contracted about the body of the child, it is seldom saved from the effect of this extreme pressure: its death is the result; and if the case be left altogether to itself, the child becomes putrid, the bones of the head looser and more compressible, and thus it is possible that it might be expelled by the uterus. Formerly, it was customary to wait for 'these signs of the death of the child' before perforating, but being those of putrescency, the patient was exposed to all the consequences that would follow decomposition of its tissues in the uterus, and hence the death of the mother was too often the result. But now we have it in our power to ascertain its death by another means, which is available long before putrescency takes place. The stethoscope has been found to be a valuable aid to the obstetrician: it sometimes enables him to determine the existence of pregnancy when all other means fail; but I know of no case where it is of more important service than in that which is before us, nor is there any in which its evidence is more certain. In pregnancy, when the child is small, the liquor amnii abundant, or the muscles of the abdomen strong, the fetal heart may not be heard; but in parturition, when the liquor amnii is discharged, the child full grown and perhaps large, the muscles of the abdomen stretched to their fullest extent, its pulsations are perfectly audible; and if once heard, there can be no change in the situation of the sound, because the child is fixed in its position. A close attention, therefore, to the fetal pulsations is necessary in such a case; and when they rapidly increase in frequency, then intermit, again return more feebly, and ultimately cease, you can have no doubt the death of the child has taken place. To prove to you the value of the evidence in this way obtained, I shall quote the very important experience of Dr. Collins as to these kinds of labors. He says: 'I have no difficulty in stating, and *that after the most anxious and minute attention to this point*, that where the patient has been properly treated from the commencement of her labor, where strict attention has been paid to keep her cool and her mind easy, where stimulants of all kinds have been prohibited, and the necessary attention paid to the state of her bowels and bladder, that, under such management, *the death of the child takes place, in laborious and difficult labor, before the symptoms become so alarming as to cause any experienced physician to lessen the head.* This is a fact I have ascertained beyond all doubt by the stethoscope, the use of which has exhibited to me the great errors I committed before I was acquainted with its application to midwifery, viz: *in delaying delivery often, I have no doubt, so as to render the result precarious in the extreme, and in some cases even fatal.*' This husband informed me, had two children dissected within her, and removed by pieces, in two previous labors. Neither he nor his wife could explain why the last two children could not be as readily delivered,

---

observation of Dr. Collins would apply to many cases of perforation that are recorded, and which have been followed by such frightful consequences that it is not surprising that they should excite the disgust of the profession. They were cases where the operation was useless, because performed too late. By means of the stethoscope it is in your power to prevent this, and to deliver the child in sufficient time to save the mother from injury. No one is justified in destroying a living child, unless there is clear evidence, from the symptoms, that the mother is in danger. According to the old rule of practice, therefore, you were placed in the dilemma, either to wait for such symptoms, or for the signs of putrefaction in the child—alternatives equally dangerous to her; but if the death of the child can be known the moment it takes place, and if it be true that its death precedes those dangerous symptoms, it is obvious that its removal by the crotchet is no longer objectionable, and perforation is deprived of all its horrors. So far as the safety of the mother and the preservation of the passages from injury are concerned, there is no comparison between perforation and the forceps. In this respect perforation is a far safer operation, if ordinary caution be exercised; the objection—the sole objection that condemns it, is the fact that the child must be destroyed, either by the uterus, or by the instrument. We freely admit the cogency of the argument; but when it is weighed against the still greater objection, that in the attempt to save the child, the soft parts of the mother may be injured to a most dangerous extent, while the preservation of the child is extremely doubtful; when we find, in the imperfect history of these operations, such as they are given to us, that the child is very generally lost, or, if there be an exception in which the child is with difficulty saved, the case is recorded with that triumphant acclamation that proves the success to be unexpected: when the risk to the mother is so great, and the prospective advantage so doubtful, you will admit that the balance is in favor of an operation by which, if properly performed, and with sufficient promptitude, the safety of the mother is at least secured.

"We are not generally favored with a faithful history of cases that illustrate the mischievous effects produced by the forceps. On the contrary, while the post-partum accidents of a skillful operation are deeply concealed in the shadows of the back-ground of the picture, the surprising, the almost miraculous, power of the instrument is put prominently forward, with all the vividness of a most glowing and high-colored description. Thus the truth is concealed from you, and so would remain, until exposed by your own dear-bought experience, except that you find scattered through the works of men whose skill is acknowledged, ominous hints and anxious warnings against the improper application of these instruments. Many evidences might be quoted to this effect: we shall direct your attention to a few of them. Your late respected professor, Dr. Davis, paid a great deal of attention to the subject of instrumental labors, and was disposed to advocate a much bolder use of the forceps than what I should recommend; nevertheless, he candidly admits, that 'of all the instruments used in the practice of midwifery, those of the present class [the forceps] are unquestionably *the most dangerous to the mother*, inasmuch as in all cases where the forceps are used, the maternal tissues are more or less liable to contusion. All the fangs and framework of the instrument are made of tempered steel, and let them be ever so well covered and defended, they will still retain a great degree of hardness, calculated to bruise and fret the soft and living texture which might be interposed between their covered surfaces and the solid walls of the pelvis.'

as two previous ones to which she had given birth. On examination, I found the child's occiput under the pubic arch, where, I was informed, it had been detained for several hours. It was likewise mentioned to

---

"The same impression of mischief leads Dr. F. Ramsbotham to warn the practitioner that 'cautiously and tenderly must this iron instrument be used! We must recollect that no sensation can be imparted to the operator's hand of any injury that may be done to the woman; and we must remember that one injudicious thrust, one forcible attempt at introduction, one violent effort at extraction, may bruise, may lacerate, may destroy!' Dr. Blundell addresses his pupils thus—'When, however, you lay your hand upon the tractor, or forceps, remember, that the accoucheur who is meddlesome may be guilty of occasioning laceration of the perineum, rupture of the vagina, compression and death of the child, inflammation of the abdomen of the mother, and many other fatal consequences, *which I myself have had occasion to see*—a list of offenses surely sufficient to alarm the prudent.'

"But let us come to more direct evidence. Riecke, in his report of the practice of the kingdom of Wurtemberg, gives the result of a very large number of cases, and among them, those in which the attempt was made unsuccessfully to remove the impacted head by the forceps. He observes—'Almost always, perforation was preceded by attempts to apply the forceps, and to the great injury of the mothers, because perforations, not preceded by such attempts, presented much more favorable results. . . . . The trials at extraction with the forceps—which many accoucheurs continue, to the extinction of the infant's life (although foreseeing the necessity for perforation)—exhaust the mother to that degree, that she necessarily sinks under the effects of these violent efforts.' In allusion to similar inquiries, Dr. Collins remarks—'It is from being thoroughly convinced of these facts by long and extensive observation, that I consider the forceps quite inapplicable when the head becomes fixed in the pelvis, and the ear can not be reached by the finger except by violence, in consequence of disproportion existing between the head and the pelvis. . . . The results I have witnessed from such practice [delivery by forceps] were most distressing: in some the neck of the bladder or urethra either lacerated or the injury by pressure from the forceps so great as to produce sloughing and consequent incontinence of urine; in others, the recto-vaginal septum destroyed, either of which renders the sufferer miserable for life; and in two cases, where the mouth of the womb was imperfectly dilated, so much injury inflicted on this part as to terminate in death.' Dr. R. Lee, in his Lectures, quotes the paragraph at full length from which these passages are extracted, and adds—'The accuracy of these remarks is fully confirmed by all the forceps cases which have come under my observation, which exceed sixty in number.' It would occupy too much time to accumulate further testimony to the same effect. I trust sufficient has been placed before you to authorize the conclusions at which I have arrived, and which are now submitted to you—viz: that when the head is impacted in the pelvic cavity, it can not be delivered by the forceps without such injury to the passages as might endanger the mother's life; that the probability of preserving the child's life is not sufficiently certain to justify an attempt which might be so hazardous; that in a great majority of these cases the death of the child takes place naturally, and it may be removed before symptoms dangerous to the mother present themselves; and lastly, that if it should happen that the reverse occurs, and danger to the mother—whether from exhaustion or extending inflammation—is indicated before the death of the child, that then perforation is called for, rather than render the risk to the mother a certainty, by the dangers that result from a forcible extraction by the forceps.'

me, that in the labor preceding this, the child's head remained impacted in about the same place for several days before it was removed by the perforator. From near the crown of the head, I could trace a depression of the skull, about as broad and as deep as the diameter of my thumb, which could be followed to the eyebrows. I then ascertained that the coccyx had been dislocated, and that it was turned in at right angles with the remaining part of the bone, to the extent of nearly an inch. It was this, therefore, which had obstructed the delivery of the child, and had caused the depression upon its skull. At the time of the examination the head was immovably impacted, and as the forceps seemed only to flatten the head laterally, and increase its antero-posterior diameter, I was obliged to content myself in simply doing what I could with my hands, trying to lessen the obstruction by pressing the head against the pubis.

"After more than an hour of uninterrupted effort, both on the part of the patient and myself, the head finally passed, but badly bruised. As soon as the chin escaped, I brought my thumbs to bear upon the protruding bone, and broke it, so that it did not interfere with the rest of the delivery. I then learned, that after the birth of the last living child, the mother, while carrying two buckets of water, one in each hand, slipped and fell in a sitting posture upon a small stone lying in her path, and so injured her spine as to cause a lameness for several weeks. I have since attended the same female, at the birth of two children, in which she had no difficulty, the os coccyx appearing to be in its normal position.

CHAPTER XXXI.

ON DIFFICULT LABOR, FROM MAL-POSITION OF THE HEAD, PRESENTATION OF THE FACE, EAR, ETC.

Difficult Labor may arise from TOO EARLY A DEPARTURE OF THE CHIN FROM THE BREAST,—*an Abnormal, or Premature Extension of the Head*—giving rise to the *Brow Presentations* of some authors. The nearer to the center of the pelvic cavity we find the posterior fontanelle, the greater will be the flexion of the head, and the more readily will it advance; and the nearer to the walls of the pelvic cavity we find this fontanelle, the greater will be the abnormal extension, or the departure of the chin from the breast, and the more slowly will labor progress; it is an excess of this departure which gives rise to face presentations.

In all normal vertex presentations the posterior fontanelle should be down toward the axis of the pelvic cavity, nearly in approximation with it; but in proportion as it recedes from this point, and approximates toward the side of the pelvis, will the anterior fontanelle be brought toward the center of the excavation. And at an early stage of the labor, this abnormal position may be known by finding this latter fontanelle near the center of the pelvis; but, if the head should have advanced as far as the inferior strait, one of the parietal protuberances will be at the pubic arch, while the anterior fontanelle will be found looking toward the inner perineal surface.

TREATMENT.—In a difficulty of this kind, the labor will speedily be finished, after having restored the flexion. To accomplish this, two modes are advised; the first is to be performed when the head has not entirely passed the superior strait, the os uteri being well dilated, the membranes ruptured, and the pains sufficiently energetic. And, when possible, it is always better to effect the adjustment at this period, than when the head has completely passed through the superior strait. Should any obliquity of the uterus exist, it must first be removed, according to the preceding directions, page 319; then introduce two or three fingers into the vagina, and during the absence of pain, slightly elevate the forehead and hold it thus, supported by the fingers during one or more pains, until the vertex is found to descend, and the forehead to apparently ascend, when the fingers may be withdrawn, and the case left to the natural powers. The object of the operation is not to push the anterior fontanelle above the superior strait, which will be found a difficult task, but to make counter-pressure during a pain, to prevent it from descending any further, thus allowing the vertex, or occiput to descend with the expulsive efforts of the uterus, and which will restore the normal flexion of the head. It may sometimes require the introduction of the whole hand, to effect this change. In performing this operation, the practitioner should be careful not to make any pressure upon the anterior fontanelle itself, but only in its neighborhood.

The second mode of operating is to be pursued when the head is completely in the excavation. The fingers, or half of the hand, if necessary, must be introduced into the vagina, and perhaps, also, within the cervix, so as to grasp the posterior-superior portion of the head, and during the absence of a pain, the head should be directed, or pressed in such a manner as to bring its anterior portion against that part of the pelvic wall facing it, while at the same time the fingers sh obtain a purchase on the edge of the parietal bones, formed. gliding of the occipital bone under them, and carefully pull t down toward the center of the pelvis; this accomplished, the vertex should be retained thus, until a subsequent pain renders the change permanent. Thus, if the vertex be toward the left acetabulum, the head will be pressed toward the right sacro-iliac symphysis, while, at the same time, the vertex is pulled downward. The hand to be introduced in this operation must be that, the palm of which is directed toward, or may be applied upon, the vertex. In cases of this kind but little could be accomplished by making pressure upward, with the fingers upon the forehead, beside which, the upper edge of the os frontis being imperfectly ossified, the force required to elevate it might indent the yielding bone, and produce some injury to the brain; hence it is better to apply the power to the more perfectly ossified posterior edges of the parietal bones. Sometimes, but very rarely, a vectis will be required to effect the proper adjustment of the head when in the pelvic cavity.

It was remarked in the Chapter on the Mechanism of Labor, that in occipito-posterior positions of the head, the movement of rotation usually changed them so that toward the latter period of labor, the occiput became placed under the pubic arch, the same as if the positions had been originally occipito-anterior. Sometimes, however, this change is not effected, and the head presents at the inferior strait, with the occiput to the sacrum, and the FOREHEAD TOWARD THE PUBIC ARCH. If the diameters of the pelvis and fetal head be normal, and the contractions of the uterus efficient, the delivery may be accomplished without any interference; the head may be expelled presenting its occipito-frontal diameter to the antero-posterior diameter of the inferior strait, or the forehead may remain at the pubic arch until the posterior part of the head has passed over the perineum. This position of the head, notwithstanding it may not interfere with a safe delivery, may be considered a mal-position. In 29,684 cases recorded by various authors, the forehead was under the pubic arch in 87, or about 1 in 342½; and of 22 children born in this position, where the results were noted, 9 were lost.

As remarked above, the delivery may be safely accomplished by the natural powers; and where the head is large, or the pelvis narrow, or where both these conditions occur at the same time, the labor will be necessarily protracted, yet the child may be born without any serious consequences to its mother or self. But where the pelvis is considerably narrower than usual, the aid of the accoucheur will undoubtedly be required.

Cases of this kind may be ascertained by making a careful examination after the rupture of the membranes; the forehead not being as round as the occiput, will present a flatter surface which does not fill up the pubic arch, the anterior fontanelle will be found toward the pubic symphysis, the sagittal suture will be felt passing backward, in the direction (nearly) of the antero-posterior diameter, to the posterior fontanelle, which latter will be toward the sacrum. The parietal bones do not overlap one another as usual, the swelling of the scalp forms less rapidly, and sometimes the finger can be passed up behind the symphysis pubis and detect the eyes and root of the nose. If the head has suffered for a long time from pressure while in the pelvis, there may be some difficulty in detecting the sagittal suture and posterior fontanelle.

TREATMENT.—We should not interfere in these cases as long as the uterine contractions are regular, and the head advances, however slowly. But when the contractions cease, or are not sufficient to cause any advance of the head, a careful examination of the parts and of the fetal head must be made to ascertain their relative proportions, and such aid must be afforded as the circumstances of the case may require. On page 299 I have given the mode of management recommended by Dr. Dewees for the purpose of overcoming the difficulty under consideration, but although this frequently succeeds, it as often fails, and the practitioner will then have to resort to the forceps, especially where there is a failure of uterine power, or, perhaps the perforator may be demanded; of course, the period for operating will be selected according to the degree of the difficulty, and the symptoms of the patient.

Not unfrequently, in occipito-posterior positions, there may be a delay in the descent of the head, *before* it has reached the inferior strait. The membranes having ruptured, the expulsive contractions are found to cause no advance of the head; an examination will detect the posterior fontanelle toward one of the sacro-iliac symphyses, and the sagittal suture may be traced upward and forward to the anterior fontanelle, which will be located behind the opposite acetabulum. In cases of this kind, an early interference is improper, the practitioner should wait until from the number of strong pains, he is satisfied that they are unable to advance the head, when, for the purpose of ultimately bringing the occiput under the pubic arch, he may grasp the cranium between the thumb and fingers, during the absence of a pain, and move the face toward the right or left ilium, according as it originally presented to the right or left acetabulum; being careful not to carry it into the hollow of the sacrum, notwithstanding the readiness with which so great a change might be effected, because, should the child's body fail to follow the rotation given to the head, a serious injury to the neck would, very probably, be the result; therefore, after having inclined the face to one of the ilia, the rest of the process must be left to nature. Should the manipulation fail, the face returning to its original position with the pain, it may be repeated several times until it succeeds. Should the head become impacted in the pelvic cavity before the operation is attempted, it is very probable that the forceps will be required to terminate the delivery. (*See Occipito-Pubal Position, page* 296, *and Occipito-Sacral Position, page* 301.)

As a general rule, FACE PRESENTATIONS, may be included among natural labors, from the fact that they commonly terminate without any artificial aid; the labors, however, are very tedious and painful to the mother, and occasion considerable distortion of the child's features. They are now correctly considered to be deviations from a head or vertex presentation, and though delivery, in the greater number of instances, is effected by the natural powers, still they should always be regarded as mal-positions.

When the head is in a proper state of flexion, the chin touching or approximating toward the breast, the presentation is always a normal one of the head, but if there is a premature extension or departure of the chin from the breast, the tendency will be toward a face presentation, in which the head gradually becomes bent backward so far as to ultimately place the face nearly flat across the oblique diameter of the superior strait, looking down into the pelvis; and this position almost always occasions a tedious labor, not unfrequently requiring the aid of the accoucheur.

In relation to the cause of the difficulty in this presentation, Prof. Meigs remarks: "The fetal head being an oval, five inches long, from the vertex to the chin, and more than three and a half inches wide at the widest part, it ought to make no difference, as far as the mere head is concerned, whether the chin or the vertex advances first in labor, because, in either case, the same circumferences of the head are presented to the planes through which they are to be transmitted. The foramen magnum of the occipital bone being nearly equidistant from the vertex and chin, and situated on one side of the oval, the peculiar difficulties and hazards of these labors are attributable, rather to the nature of the articulation by which the neck and head are conjoined, than to the form of the head itself, when advancing with the face downward. The nature of this articulation is such, that extension of the head can not take place so well as flexion; hence the requisite dip of the occipito-frontal diameter is not effected in face cases without difficulty, and the consumption of much time."

"Let the reader figure to himself the state of the spinal column of a child, urged on in labor by powerful uterine contractions, directed to its expulsion with the face in advance. The inferior-posterior part of the head is pressed against the back of its neck, or between its scapulæ, which could not be the case without bending the cervical spine backward, like a bow, while the dorsal and lumbar vertebræ are curved in the opposite direction, causing thus a double antero-posterior curve, on which, in consequence of the elasticity of the two arches, much of the expulsive force is vainly expended; so that, though the power may be as great as in a common labor, it produces much less effect than in a common labor—a great part of every pain being expended in reproducing the greatest amount of curvature; for the elasticity of the two curves is such that they are straightened as soon as the pain subsides, at least in some measure, while the rest of the pain is used in pushing the face onward." These remarks of Prof. Meigs are undoubtedly correct, and should be constantly kept in view during a labor of the kind under consideration.

Face presentations are usually forehead presentations at first, in which there is a departure of the chin from the breast at an early period of labor, and an examination at this time, when the forehead presents, may mislead the practitioner, who, feeling the firm, globular presenting brow, rests satisfied that it is a head case, and only discovers his error when the labor has too far advanced for successful interference. In these cases, it must be remembered that the forehead presents first; and as the uterine contractions continue, extension of the head gradually progresses, so that one eye, then the other, the nose, the mouth, and the chin, are successively placed within reach of the finger. Instances have been met with, however, where the face originally presented at the brim.

The cause of presentations of the face is not satisfactorily understood: the most common belief is, that it is owing to uterine obliquity. For instance, if the obliquity carries the fundus far down on the right side, the vertex, instead of presenting in the direction of the axis of the brim, will present at a greater or less degree of inclination to it, and the expulsive contractions of the uterus, acting in the direction of its longitudinal axis, will force the fetus from above downward, and from right to left, so that the vertex will be made to glance upward into the left iliac fossa, and a shoulder be presented at the brim, or, the vertex being arrested at the left border of the superior strait, the forehead will present, extension will gradually be produced by the continuance of the pains, and the head be forced backward upon the child's back. This is, probably, the cause of the major number of these presentations, yet they are sometimes met with where there is no obliquity present, and it is very difficult to assign any correct reasons for their occurrence. Labor coming on before the position of the fetus is normally established, and excessive coughing, have been named among the causes, and may occasionally effect a change in the position of the fetal head, but where a face position is a primitive presentation, we have no satisfactory idea of its origination.

DIAGNOSIS.—If the examination be made at an early period of labor, before the membranes are ruptured, it will be very difficult to ascertain the character of the presentation, from the fact that the forehead, which only presents at that time, may readily be mistaken for a vertex position. But after the extension of the head is completed, and the membranes have ruptured, the diagnosis becomes more easy: on one side of the pelvis we find the forehead imparting the sensation of a rounded, solid surface, through which the anterior portion of the sagittal suture may be felt traversing; carrying the finger slowly along to the opposite side, in the median line, it meets with a triangular elevation, increasing in size as it leaves the forehead, and which is the nose; at its base will be found two small openings, the nares, which always look toward that portion of the pelvis where the chin is situated, and which consequently afford great aid in determining the position. On either side of this triangular protuberance, at its apex, the eyes will be felt as two soft tumors, surrounded by a circle of bone; and the examination should be gently and carefully conducted, lest the eyes become seriously injured or even destroyed. A short distance from the base of the nose will be found the mouth, conveying the sensation of a transverse fissure bounded by the superior and inferior maxillary arches.

If a long time has elapsed after the rupture of the membranes, before the delay in the labor induces the accoucheur to make a more careful examination, the diagnosis will be more difficult; hence the necessity for making a thorough examination immediately or very soon after their rupture, in all cases of labor. The tedious progress of the head, and the compression which it undergoes, cause the face to become very much tumefied: the cheeks being greatly swollen and at the same time pressed toward each other, a fissure is formed between them, in which the diagnostic characters of the face are concealed, and which might lead the practitioner to confound them with the nates and their intervening fissure. The lips also swell, become wrinkled, and turn in, presenting a rounded orifice instead of the usual transverse fissure, and which has been mistaken for the anus, but which may be at once known by introducing the finger into it, and feeling the tongue and alveolar processes.

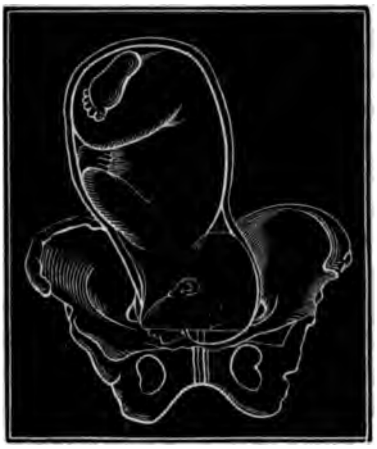
Whenever a case of face presentation is met with, it should be announced to the friends of the patient, together with the probability of considerable distortion of the features of the child when born, else its frightful appearance may be attributed to some improper violence, or perhaps want of skill, on the part of the medical attendant. If the labor is a tedious one, the appearance of the newborn child will be very repulsive, its face swollen, the eyelids in a tumefied state, and one or both eyes closed, the nose also swollen to an enormous extent, and the whole features presenting a dark or livid appearance, scarcely being recognized as the countenance of a human being. These appearances generally pass off in a few days. Sometimes, when the labor is very tedious, the congestion or stasis of the blood extends even to the brain, creating an apoplectic condition, and occasionally the death of the child.

Although the face may present in various positions, yet, for practical purposes, the two heretofore named are all-sufficient, viz: the *left mento-iliac*, and the *right mento-iliac*. And these names will apply to the positions when the chin is to the left or right side of the pelvis, whether they be directly transverse, as more frequently happens, or have the chin turned more or less anteriorly near the body of the pubic bone, or posteriorly toward the sacro-iliac symphysis. So that, for instance, should the face be placed in the pelvis exactly in a transverse position, with the chin to the right ilium, or obliquely with the chin toward the right sacro-iliac symphysis, or toward the right pubic bone, the obliquity of the position does not, in either case, interfere with its claim as a right mento-iliac position; and so of the left, when the chin is placed at the left side of the pelvis. The transverse positions of face cases being the most frequent, are regarded as the primitive positions, from which the oblique positions are derived during the progress of labor.

1. MECHANISM OF LEFT MENTO-ILIAC POSITION.

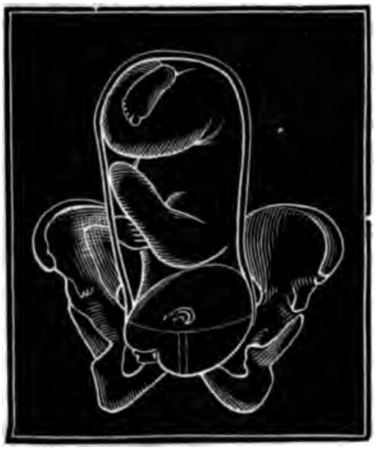
This position is not so frequent as the right mento-iliac, and is usually termed the second position; but, for the purpose of preserving regularity, and aiding the student in recollecting all positions, as being successively to the left, right, and front, I have given it as the first position. As a general rule, previous to the rupture of the membranes, the forehead will be found near the center of the superior strait, the chin being placed at the left, and the anterior fontanelle at the right side of the pelvis. The mento-bregmatic diameter of the fetal head corresponds to the transverse diameter of the upper pelvis, the bi-temporal of the former to the antero-posterior of the latter, and the occipito-frontal diameter of the head is in a direction with the axis of the superior strait. The back of the child is toward the right side of the mother, and its abdomen toward her left side; its left side is in front, and its right behind; the feet are above and to the left. (*Fig.* 54.) (*Figures* 54, 55, *and* 56, *represent the right mento-iliac positions, but as far as the mechanism of labor is concerned, they will answer to illustrate the left mento-iliac positions.*)

FIG. 54.



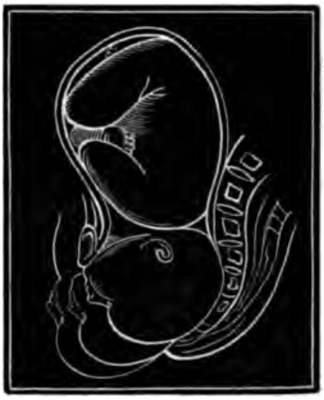
As soon as the membranes rupture, and the expulsive contractions commence, the head being in a state of moderate extension, and meeting with resistance, *forced extension* takes place, which gradually causes the face to present at the superior strait instead of the forehead, as heretofore explained. The fronto-mental diameter of the head now corresponds, instead of the mento-bregmatic, to the transverse diameter of the brim; the bi-temporal to the antero-posterior, and the fronto-mental circumference offers to that of the superior strait; the body of the child remains unchanged, and a line drawn from the upper lip of the child to the posterior fontanelle, will give the direction of the axis of the upper strait. (*Figure* 55.) As soon as the extension of the head is completed, it engages in the pelvic cavity and *descends* as low as possible, or as far as the length of its neck will permit. The depth of the lateral part of the pelvis is three inches, and as the length of the neck does not reach this measurement, the descent of the head is limited, and must cease at some point short of the pelvic floor; for if it advanced further, the head and part of the child's breast would be contained in the pelvic cavity at the same time, a thing not ordinarily possible. The resistance of the soft parts and the inclined pelvic planes cause the head to

FIG. 55.



rotate, carrying the chin from left to right, in front and behind the symphysis pubis, while the forehead passes from right to left, backward into the hollow of the sacrum. Should the chin fail to rotate toward the symphysis pubis, the labor will be immensely difficult, if not altogether impossible, because the occipito-mental diameter of the head must, toward the termination of the process, offer to the antero-posterior of the inferior strait, before the head can be born. The descent and rotation of the head being now completed, the process of flexion commences, the pains push the body of the inferior maxillary bone, and finally the fore-part of the neck against the posterior surface of the pubes, which arrests its further progress, and, in consequence of the impossibility of any further descent of the neck, the expulsive force is exerted, at this time, principally upon the occiput, and the head is gradually delivered by successively presenting at the vulva, first the chin, then the mouth, nose, eyes, forehead, anterior fontanelle, posterior fontanelle, and occiput, which latter has to traverse the whole anterior sacral surface, a distance of about five inches and a quarter; and during the delivery the perineum becomes greatly distended. As the chin emerges under the pubic arch, there is not a correspondence of the whole measurement of the occipito-mental diameter of the fetal head with the antero-posterior diameter of the inferior strait, as shown in the linear representation of the various degrees of the head's disengagement, in *Fig.* 56, in which, while the head is in the same position, the occiput is represented as departing more and more from the shoulders. The head being disengaged, the motion of restitution follows, placing the occiput to the right side of the mother, and which, as in vertex presentations, is owing to the engagement of the shoulders at the brim. The head being delivered, the expulsion of the body is effected as in ordinary vertex positions. It must be recollected, that in this position the left side of the child's face is anterior and rather more depressed than the other side upon entering the superior strait, and on making an examination, the finger comes in contact with the left eye or malar bone, upon which part is formed the primary tumor. Nægèle observes that the swelling forms "first upon the upper part of the" left "half of the face, which in this species of a face presentation (*left mento-iliac*) is always situated lowest." "If the progress of the head

FIG. 56.



through the external passages be unusually rapid, this is the only tumefaction observed; but if it advances slowly, and the head remains a long time in the cavity of the pelvis before it actually enters the vagina, the inferior half of the *left* side of the face, viz: part of the *left* cheek, will be remarked after birth as being the principal seat of the swelling," a secondary tumor being formed there.

It is sometimes the case, especially when the chin is situated rather posteriorly, that previous to the movement of rotation a certain degree of flexion takes place, which causes the forehead to descend to the pelvic floor, after which the chin rotates to the pubic symphysis, and the delivery is accomplished as in the other instances.

2. MECHANISM OF RIGHT MENTO-ILIAC POSITION.

This is the most frequent of the face presentations, and is usually named the first position. The positions of the diameters of the fetal head, and their relations with the pelvic diameters, will be the same as in the left mento-iliac cases; the exceptions are, that in the present position the forehead corresponds to the left iliac fossa, and the chin to the right iliac fossa; the child's back is toward the left side of the mother, and its abdomen toward her right side; its right side is in front, its left behind, and the feet are above and to the left. (*Fig.* 54.) The mechanism in this case is precisely similar to the one just described, with the exception that rotation takes place from right to left.

TREATMENT.—Although face presentations are accidents, or deviations from vertex positions, yet, as a general rule, the natural powers will be found adequate to safely terminate the labor, and the practitioner must not interfere as long as the pains are regular and energetic, the parts cool, the patient free from febrile symptoms, and the head advancing, however slowly. If, however, the pains become feeble and insufficient, or accidents should occur, then interference will be required. Turning was formerly recommended by authors, but from the difficulty, and the danger to both the mother and child, attending this operation, it is at the present day very rarely attempted, and is not advised by recent authorities.

Could we positively know the presentation and position of the head, at an early stage of the labor, previous to its descent into the pelvic cavity, we might possibly, when required, restore it to a normal situation, by the manipulation recommended by Dr. Dewees:

"In the first and second positions, we must have the concurrence of the following circumstances, before we attempt the reduction of the head: first, the uterus must be sufficiently open to permit the hand to pass, with little or no difficulty; second, the head must not have entirely passed the superior strait; third, the waters must have been recently expended. If these advantages combine, after having the woman properly placed, a hand must be passed into the uterus; and the choice of the hand is a matter of the first consequence to the success of the operation: the governing rule is simple, and easily remembered; namely, the hand which is to the side on which the vertex and forehead are placed; that is, in the first, the right hand must be used; because, when before the patient, the right hand offers to the left side of her, or the pelvis; if the second be the position, the left hand must be employed, for a like reason. [These positions are reversed in my arrangement. K.]

"In the first position of the face, we pass the right hand into the uterus in such a manner as shall put the back of the fingers to the posterior part of the pelvis, or before the left sacro-iliac symphysis, and place them on the side of the head, while the thumb is pressed against the opposite side; the head is then to be firmly grasped, and raised to the entrance of the superior strait. When the head is thus poised, the extremities of the fingers are to be carried over the vertex, while the thumb is moved to the center of the upper part of the forehead; the fingers are then made to draw the vertex downward, while the thumb tends by its pressure, to carry the face upward, thus executing a compound action upon the head. All this, it should be remembered, must be executed in the absence of pain; if we find, when pain comes on, that the vertex moves sufficiently downward, and the face upward, to give assurance it will now descend, we may withdraw the hand, and trust the rest to the action of the uterus. But if, on the contrary, upon the accession of the pain, we find the face still has a tendency downward, we may be certain that the reduction is incomplete; and we must again and again attempt it, in the absence of pain, if it be necessary: for, under the circumstances I have stated, we are pretty sure of success under a well-directed management.

"In the second position, we employ the left hand, under the conditions I have stated for the first, and act in every respect as directed for that presentation."

But in pursuing the method here advised, we must recollect, that while the head is above the superior strait, the dilatation of the os uteri is seldom sufficient to allow the introduction of the hand into the uterus for the purpose of effecting the change, and the enlargement of the orifice by dilatation continues to extend only as the presenting part of the child descends; consequently, the above operation is only a bare possibility, but which it may be necessary sometimes to attempt.

Most generally, the existence of a face presentation is not ascertained until the part has so far descended into the pelvic cavity, as to render it impossible, either to push it into the upper pelvis, or effect the above operation of bringing down the vertex. In such instances, it will become necessary to be guided by the general principle of obstetrics, to wait until symptoms present which indicate the need of artificial aid, and then make use of those means best calculated to overcome the difficulty. The vectis will probably be found the most appropriate instrument in a majority of cases; if the head be low down, the forceps may, perhaps, be employed advantageously—though the selection of the instrument must depend upon the peculiar character of the case, and the judgment of the practitioner. If these means fail, the only resource is craniotomy. In these cases, much patience, gentleness, and sympathy are required on the part of the practitioner, who must encourage his patient from time to time, and endeavor to keep her from becoming depressed and discouraged.

I have not, heretofore, named the only and positive rule to be observed in all face cases, whatever may be their position, viz: *to bring the chin to the pubic arch*, so that the original flexion of the head may be restored as soon as possible after the delivery of the chin; and in by far the greater number of instances in which this rotation is effected, the labor will terminate without any formidable results. If this rotation cannot be effected, and the forehead should present at the pubic symphysis, the practitioner must make use of means the most applicable to the emergency. Prof. Meigs remarks, that in all face presentations, "the great doctrine is, to bring the chin to the pubic arch, because the chin, being the mental extremity of the five inch mento-occipital diameter, may escape by gliding an inch downward, behind the symphysis pubis; whereas, if it be directed backward to the sacrum, it must slide five inches down the sacrum and coccyx, and from three to three and a half inches over the extended perineum before it can be born; but, five inches and three inches make eight inches. The child's neck is not eight inches long. Therefore, before the chin can slide down the sacrum, and off the anterior edge of the extended perineum, a good part of the child's thorax must be pressed or jammed into the excavation along with the head, the vertical diameter of which alone is more than three and a half inches." This is a correct representation of the matter, and the practice alluded to, of bringing the chin to the pubic arch, is the one at present universally pursued by all scientific accoucheurs.

EAR PRESENTATIONS, or *Presentations of the Side of the Head*, occur very rarely; they are considered as deviations from the vertex presentations, and occasioned by an undue obliquity of the uterus, or, perhaps in some instances, an abnormal amount of liquor amnii. In 20,517 instances they have been met with only 6 times, five of which were of the left side of the head, and the remaining one of the right. They are known by the presence of an ear at the superior strait. Each side of the head may present in three different positions, which are determined by the relations of the ear to the maternal pelvis; they have been classified as follows:

PRESENTATION OF THE RIGHT SIDE.

1*st.* *Position*	Lobulo-pubal.
2*d.* *Position*	Right lobulo-iliac.
3*d.* *Position*	Left lobulo-iliac.

PRESENTATION OF THE LEFT SIDE.

1*st.* *Position*	Lobulo-pubal.
2*d.* *Position*	Right lobulo-iliac.
3*d.* *Position*	Left lobulo-iliac.

DIAGNOSIS.—As there is no part of the fetal body likely to be confounded with the ear, its detection may be accomplished with but little difficulty. The ear may be felt, with the surrounding bony head; we know the face to be situated anterior to the tragus, and the occiput to be behind the helix, or circumference of the ear, so that from these marks we may readily determine the position of the head.

In the LOBULO-PUBAL POSITION, *of the Right Side of the Head*, the lobe of the ear, as well as the base of the cranium, look toward the pubes, the long diameter of the external ear presents in the direction of the antero-posterior diameter of the superior strait, the vertex is at the promontory of the sacrum, the convexity of the helix and the occiput are directed toward the left side of the pelvis, and the face and tragus toward the right side. The child's back is toward the left side of the mother, its front toward her right side, its left side looks posteriorly, its right side anteriorly, and its feet are above and to the right.

This is a deviation of a left occipito position, produced by an anterior obliquity of the uterus, and should be remedied by placing the patient upon her back, with the pelvis somewhat elevated, raising the fundus upward and backward, and then applying a bandage firmly around the abdomen. The obliquity removed, the vertex passes in front of the sacral promontory, the head rises, and gradually recovers its original left occipito position, and the delivery is terminated naturally.

In the RIGHT LOBULO-ILIAC POSITION, *of the Right Side of the Head*, the lobe of the ear looks toward the right side of the pelvis, the long diameter of the external ear presents in the direction of the trans-

CHAPTER XXXII.

ON PRETERNATURAL LABOR.—PELVIC PRESENTATIONS.

PRETERNATURAL LABOR, is where the head does not present, as in shoulder or breech presentations;—prolapsus of the umbilical cord, plurality of children, and monsters, are likewise included in this class. Females frequently have preternatural presentations in several successive labors, and it is impossible to assign any satisfactory cause for them. They cannot be the results of violent shocks experienced during gestation, for they more frequently occur in cases where the period of pregnancy has passed free from any accidents. Dr. Denman, in 1795, remarked: "It seems doubtful, therefore, whether we ought not to exclude accidents as the common causes of these presentations, and search for the real cause from some more intricate circumstance; such as, the manner after which the ovum may pass out of the ovarium into the uterus; some peculiarity in the form of the cavity of the uterus or abdomen; in the quantity of the waters of the ovum at some certain time of pregnancy; or, perhaps, in the insertion of the funis into the abdomen of the child, which is not in all cases confined to one precise part, but admits of considerable variety." At the present day we are no further enlightened on this point than were the profession in his time. Some instances may, probably, be owing to uterine obliquity, or to peculiarity of the formation of the pelvis; thus, in three successive labors, I have delivered the same female by turning, each instance being a shoulder presentation in the second left cephalo-iliac position. This erson, when young, had been employed to take care of children, and as in the habit of carrying them the greater part of the time on one ip: the crest of the left ilium was from an inch to an inch and a half gher than that of the right, when she stood erect. Whether this irregarity was owing to the manner in which she held the children during r youth, or whether it was the occasion of the shoulder presentations, m not prepared to state: it is very difficult, in such obscure matters, obtain, from one or two incidents connected with them, more than gestions.

uring gestation it is a very difficult, if not an impossible matter, for les to determine with certainty a preternatural position: they may ct that such is the case, and may almost be positive of it, from cerircumstances not usual with them during this period; yet, although fears are occasionally confirmed when labor comes on, they more verse diameter of the pelvis (or nearly so), the vertex is at the left iliac fossa, the convexity of the helix and the occiput are directed toward the pubes, and the face and tragus toward the sacrum. The child's back is anteriorly, its front posteriorly, its left side is toward the left of the mother, its right side toward her right, and the feet above, and toward her left, and back.

This is, likewise, a deviation from a left occipito position, occasioned by an extreme right lateral uterine obliquity, and should be managed by placing the female on her left side, elevating the fundus upward and to the left, and applying the bandage as before. The obliquity removed, the head engages in the brim, and the delivery terminates naturally.

In the LEFT LOBULO-ILIAC POSITION, *of the Right Side of the Head*, the lobe of the ear is toward the left side of the pelvis, the long diameter of the concha is parallel, or nearly so, to the pelvic transverse diameter, the vertex is at the right iliac fossa, the convexity of the helix and the occiput look toward the sacrum, and the face and tragus toward the pubes. The child's back is toward the maternal back, its front anteriorly, its left side toward the right of the mother, its right toward her left, and the feet above, and toward her right, and front.

This is a rare presentation, and is a deviation from a left occipito-posterior position; it is produced by an extreme left lateral obliquity. The treatment is similar to the previous instances; the female must be placed upon her left side and bandaged; the vertex engages in the brim, and the labor terminates as in a left occipito-posterior position.

In these lateral obliquities, the object of the bandage is to prevent the uterus, after a change in its position has been effected, from returning to its original inclination.

When the LEFT SIDE OF THE HEAD presents, the general relations with the pelvis are the same as in the preceding instances, but the partial relations are inverted. Thus, in the LOBULO-PUBAL POSITION *of the Left Side of the Head*, the lobe of the ear is toward the pubes, the long diameter of the concha corresponds with the pelvic antero-posterior diameter, and the vertex is at the sacral promontory; but the convexity of the helix and the occiput are directed toward the right side of the pelvis, and the face and tragus toward the left. The child's back is toward the right side of the mother, its front toward her left side, its left side looks anteriorly, its right posteriorly, and its feet are above and to the left.

In the RIGHT LOBULO-ILIAC position 'eft side, the l
the ear will be directed toward the right si pelvis, the
toward the left, the occiput and convexity o ward the

and the face and tragus toward the pubes. The fetal back will be directed backward, its anterior plane in front, its left side to the right of the mother, its right to her left, and its feet above, toward her left and front.

In the LEFT LOBULO-ILIAC position of the left side, the lobe of the ear is to the left side of the pelvis, the vertex to the right, the convexity of the helix toward the pubes, and the tragus toward the sacrum. The fetal back is directed to the front of the mother, its front to her back, its left side to her left, its right side to her right, and its feet above, toward her right, and back. All these mal-positions are to be rectified upon the general principles described above: if these fail, efforts may be made to bring down the vertex, when the head is at the brim, by a manipulation (somewhat similar to that recommended by Dr. Dewees for restoring face presentations to vertex, and which is extracted from his Obstetrics on page 372 of the present work), in which the head will have to be slightly elevated, and then have lateral or anterior pressure or pushing made upon the vertex in a direction toward the chin, followed by a drawing down of the vertex. It may be best performed, after reduction of the uterine obliquity and the application of the bandage, by placing the patient on her hands and knees, with the hips elevated and the shoulders depressed, which position will, in a measure, remove the weight of the child's head from the brim, and thus facilitate the operation. This, however, will seldom be needed, and may frequently fail. In cases requiring further aid, it will be prudent to wait, in order to ascertain the adequacy of the natural efforts; and should these fail, or the usual symptoms demanding interference present themselves, the delivery must be terminated by the vectis, the forceps, or the perforator, as the exigencies of the case may require. Turning has been recommended, previous to the rupture of the membranes, when the os uteri is considerably dilated, soft, and dilatable, and may possibly be advantageous in some cases; but after the membranes have given way, it must not be attempted.

Labor may be rendered difficult, by a COMPOUND PRESENTATION, in which *one of the Extremities Presents with the Head*, as a hand, arm, or foot. While the fetus is within the uterus, its position is generally with the arms across the chest, and sometimes with one or both hands against each ear on the sides of the head: in these latter instances, when the membranes rupture and the liquor amnii is discharged, one
r both hands, or even the whole arm, may descend with the head, and
s more apt to occur when the membranes have ruptured prema-
These compound presentations are frequently occasioned by a
lvis, and when such is the case, the delivery may be safely
t

verse diameter of the pelvis (or nearly so), the vertex is at the left iliac fossa, the convexity of the helix and the occiput are directed toward the pubes, and the face and tragus toward the sacrum. The child's back is anteriorly, its front posteriorly, its left side is toward the left of the mother, its right side toward her right, and the feet above, and toward her left, and back.

This is, likewise, a deviation from a left occipito position, occasioned by an extreme right lateral uterine obliquity, and should be managed by placing the female on her left side, elevating the fundus upward and to the left, and applying the bandage as before. The obliquity removed, the head engages in the brim, and the delivery terminates naturally.

In the LEFT LOBULO-ILIAC POSITION, *of the Right Side of the Head*, the lobe of the ear is toward the left side of the pelvis, the long diameter of the concha is parallel, or nearly so, to the pelvic transverse diameter, the vertex is at the right iliac fossa, the convexity of the helix and the occiput look toward the sacrum, and the face and tragus toward the pubes. The child's back is toward the maternal back, its front anteriorly, its left side toward the right of the mother, its right toward her left, and the feet above, and toward her right, and front.

This is a rare presentation, and is a deviation from a left occipito-posterior position; it is produced by an extreme left lateral obliquity. The treatment is similar to the previous instances; the female must be placed upon her left side and bandaged; the vertex engages in the brim, and the labor terminates as in a left occipito-posterior position.

In these lateral obliquities, the object of the bandage is to prevent the uterus, after a change in its position has been effected, from returning to its original inclination.

When the LEFT SIDE OF THE HEAD presents, the general relations with the pelvis are the same as in the preceding instances, but the partial relations are inverted. Thus, in the LOBULO-PUBAL POSITION *of the Left Side of the Head*, the lobe of the ear is toward the pubes, the long diameter of the concha corresponds with the pelvic antero-posterior diameter, and the vertex is at the sacral promontory; but the convexity of the helix and the occiput are directed toward the right side of the pelvis, and the face and tragus toward the left. The child's back is toward the right side of the mother, its front toward her left side, its left side looks anteriorly, its right posteriorly, and its feet are above and to the left.

In the RIGHT LOBULO-ILIAC position of the left side, the lobe of the ear will be directed toward the right side of the pelvis, the vertex toward the left, the occiput and convexity of the helix toward the sacrum, and the face and tragus toward the pubes. The fetal back will be directed backward, its anterior plane in front, its left side to the right of the mother, its right to her left, and its feet above, toward her left and front.

In the LEFT LOBULO-ILIAC position of the left side, the lobe of the ear is to the left side of the pelvis, the vertex to the right, the convexity of the helix toward the pubes, and the tragus toward the sacrum. The fetal back is directed to the front of the mother, its front to her back, its left side to her left, its right side to her right, and its feet above, toward her right, and back. All these mal-positions are to be rectified upon the general principles described above: if these fail, efforts may be made to bring down the vertex, when the head is at the brim, by a manipulation (somewhat similar to that recommended by Dr. Dewees for restoring face presentations to vertex, and which is extracted from his Obstetrics on page 372 of the present work), in which the head will have to be slightly elevated, and then have lateral or anterior pressure or pushing made upon the vertex in a direction toward the chin, followed by a drawing down of the vertex. It may be best performed, after reduction of the uterine obliquity and the application of the bandage, by placing the patient on her hands and knees, with the hips elevated and the shoulders depressed, which position will, in a measure, remove the weight of the child's head from the brim, and thus facilitate the operation. This, however, will seldom be needed, and may frequently fail. In cases requiring further aid, it will be prudent to wait, in order to ascertain the adequacy of the natural efforts; and should these fail, or the usual symptoms demanding interference present themselves, the delivery must be terminated by the vectis, the forceps, or the perforator, as the exigencies of the case may require. Turning has been recommended, previous to the rupture of the membranes, when the os uteri is considerably dilated, soft, and dilatable, and may possibly be advantageous in some cases; but after the membranes have given way, it must not be attempted.

Labor may be rendered difficult, by a COMPOUND PRESENTATION, in which *one of the Extremities Presents with the Head*, as a hand, arm, or foot. While the fetus is within the uterus, its position is generally with the arms across the chest, and sometimes with one or both hands against each ear on the sides of the head: in these latter instances, when the membranes rupture and the liquor amnii is discharged, one or both hands, or even the whole arm, may descend with the head, and this is more apt to occur when the membranes have ruptured prematurely. These compound presentations are frequently occasioned by a large pelvis, and when such is the case, the delivery may be safely accomplished without assistance. But when the pelvis is small, the presence of the limb or hand increases the diameter of the head, and prevents its descent into the cavity; and if the uterine contractions are energetic, an arrest or impaction of the head may take place at the superior or inferior strait, and, perhaps, terminate fatally. When the foot, hand, or arm presents with the head, it must be pushed back with two or three fingers, during the absence of a pain, and held there until one or more subsequent pains causes the head to descend so low as to prevent any further falling of the extremity, after which the labor must be left to the natural powers. In performing this operation, the accoucheur must be exceedingly careful not to draw the arm or hand down, nor to displace the head, as he might thereby convert the case into a shoulder presentation. In order to effect a successful manipulation of this kind, the whole hand will require to be introduced into the vagina, and partly through the os uteri. The operation should not be attempted until the os uteri is sufficiently dilated, and the expulsive pains have commenced; for if it be attempted in the first stage of labor, there will be more danger of displacing the head, and of producing an unnecessary degree of irritation of the cervix uteri, and the practitioner should be governed by this rule, even should the membranes have become prematurely ruptured. The upper extremities will generally be more easily returned, on account of their less volume, than the lower.

If the limb cannot be returned, the practitioner must wait, as in other instances, until satisfied that the natural efforts are inadequate to terminate the labor, and unfavorable symptoms begin to manifest themselves, when it will become necessary to turn, or employ the forceps, or perform craniotomy, according to the peculiar circumstances of the case. It is impossible to lay down any special management of these cases: each one will have its own peculiarities, which, together with the tact and judgment of the attending accoucheur and his medical advisers, must determine the course to be pursued.

Sometimes both the hands and feet will present together, when it may become necessary to bring down the feet (and more especially when the feet present with the breech), and thus convert it into a footling case. In doing this, the practitioner cannot be too careful in his examination, lest he occasion a descent of the arm or hand, or bring down a hand instead of a foot. Should there be a prolapse of the cord, in connection with these limb presentations, the case becomes still more serious, as far as the child is concerned; and the management should be in accordance with the rules hereafter given for this complication,—hastening the delivery as soon as the pulsations are found to diminish.

CHAPTER XXXII.

ON PRETERNATURAL LABOR.—PELVIC PRESENTATIONS.

PRETERNATURAL LABOR, is where the head does not present, as in shoulder or breech presentations;—prolapsus of the umbilical cord, plurality of children, and monsters, are likewise included in this class. Females frequently have preternatural presentations in several successive labors, and it is impossible to assign any satisfactory cause for them. They cannot be the results of violent shocks experienced during gestation, for they more frequently occur in cases where the period of pregnancy has passed free from any accidents. Dr. Denman, in 1795, remarked: "It seems doubtful, therefore, whether we ought not to exclude accidents as the common causes of these presentations, and search for the real cause from some more intricate circumstance; such as, the manner after which the ovum may pass out of the ovarium into the uterus; some peculiarity in the form of the cavity of the uterus or abdomen; in the quantity of the waters of the ovum at some certain time of pregnancy; or, perhaps, in the insertion of the funis into the abdomen of the child, which is not in all cases confined to one precise part, but admits of considerable variety." At the present day we are no further enlightened on this point than were the profession in his time. Some instances may, probably, be owing to uterine obliquity, or to peculiarity of the formation of the pelvis; thus, in three successive labors, I have delivered the same female by turning, each instance being a shoulder presentation in the second left cephalo-iliac position. This person, when young, had been employed to take care of children, and was in the habit of carrying them the greater part of the time on one hip: the crest of the left ilium was from an inch to an inch and a half higher than that of the right, when she stood erect. Whether this irregularity was owing to the manner in which she held the children during her youth, or whether it was the occasion of the shoulder presentations, I am not prepared to state: it is very difficult, in such obscure matters, to obtain, from one or two incidents connected with them, more than suggestions.

During gestation it is a very difficult, if not an impossible matter, for females to determine with certainty a preternatural position: they may suspect that such is the case, and may almost be positive of it, from certain circumstances not usual with them during this period; yet, although their fears are occasionally confirmed when labor comes on, they more frequently find themselves mistaken. Nor is it a more easy task for the accoucheur to ascertain, during pregnancy, a preternatural presentation, although some have professed an ability to decide by the sensation imparted to the hand, upon an abdominal exploration over the uterus at an advanced period; also, by the situation at which the pulsations of the fetal heart are heard. But I place no confidence in these methods, either singly or combined. It is not until the labor has actually commenced, that we can learn with positiveness the presentation of some other part than the head. When the membranes do not present the globular form usual in head presentations, but may be felt protruding into the vagina, having a peculiar, elongated, or conical-pointed shape, we may suspect a preternatural presentation, though this has been occasionally met with in vertex positions. "Sometimes, before the os uteri is much dilated, the membranes, filled with liquor amnii, pass into the upper part of the vagina, and form a considerable sac with a narrow neck."—(*Lee.*) A spontaneous and premature rupture of the membranes, is generally a diagnostic sign of preternatural presentation, in which case an internal examination should be made as soon as possible, in order to determine its character. If, previous to the rupture of the membranes, when the os uteri is somewhat dilated, we cannot feel the presenting part, or, if felt, it is more movable, less smooth, globular, and resisting, than the head, a preternatural presentation may be suspected: such instances must be closely watched, and great care be had not to rupture the membranes, as an early discharge of the liquor amnii will render the operation of turning very difficult, or entirely impossible. Sometimes a foot, or a hand, or the umbilical cord, may be felt and clearly recognized through the membranes, but usually the presenting part cannot be ascertained until these have ruptured.

In all labors, it is of great importance that the practitioner should ascertain, as early as possible, the nature of the presentation, in order that, where assistance is required, it may not be delayed until the golden opportunity for saving mother and child is lost. And, whenever he is positively satisfied that some other part than the head presents, he should inform the nurse, or friends of the patient, of the fact.

Presentations of the head are by far more common than those of any other part of the child, and have, therefore, been arranged under the head of natural labors; other presentations being less frequently met with, will be considered under the present head of preternatural labors. A preternatural labor may terminate by the natural powers, but the labors are, as a general rule, slow and tedious, more painful to the mother, and more hazardous to the child than in head presentations; accidents are, likewise, more apt to take place, requiring artificial assistance.

PRESENTATIONS OF THE PELVIC EXTREMITIES, as of the breech, knees, or feet, belong to preternatural labors. In the majority of these cases the delivery may be safely effected by the natural powers, in consequence of which, some eminent authors have included them among natural labors; but I consider the present arrangement as being more in accordance with the nature of the cases, and better adapted to facilitate an acquaintance with them. From the statistics given on page 286, which are the recorded statements of British, French, and German accoucheurs, it will be observed that the danger to the child is much greater in pelvic presentations than in those of the head, and that the cases in which the inferior extremities present, are more hazardous than in true breech deliveries.

The principal danger in these breech labors is to the child; the soft passages are not so thoroughly dilated by the body as by the head, because the breech, even with the legs turned up, does not present so great a bulk in circumference or diameters, as the head, and consequently, when the head is in the pelvic cavity, it can not descend until the parts become still further distended and better adapted for its advance. This renders the delivery of the head slow and tedious, during which, the cord may be exposed to a pressure resulting in fetal asphyxia; or the same result may ensue from detachment of the placenta, before the head has passed the outlet; or by pressure upon the placenta when situated between the fetal head and uterine walls; in either of which instances, the utero-placental circulation is suspended. The first (compression of the cord) is a more common cause of the child's death in footling presentations; the latter, in those of the breech. When the thighs are not flexed upon the abdomen, the child being delivered by the feet or knees, the head will advance much more slowly, in consequence of the greater resistance offered to it, than where the limbs are turned up, and the greater delay and longer-continued pressure upon the cord, renders this species of pelvic deliveries more fatal to the child.

The danger to the mother in these cases, is owing entirely to a delay in the second stage of the labor beyond a certain period, to injuries of the soft parts from compression, or improper efforts to facilitate the child's expulsion, and to narrowness or deformity of the pelvis.

DIAGNOSIS.—Previous to labor, a pelvic presentation may sometimes be ascertained, especially among women whose abdominal walls are thin, soft, and flaccid, by feeling the fetal head in the upper part of the uterus, inclined either toward the right or left side; if auscultation be resorted to, the pulsation of the fetal heart may be heard in the upper portion of the abdomen, either above, or on a level with the umbilicus; if a vaginal exploration be made, it will be found difficult to reach or distinguish the presenting part, though, sometimes, instead of the hard, globular tumor felt in head presentations, a small tumor, the foot, may be felt, and *ballotted*.

But the most certain method of diagnosis is during labor, in the absence of pain, when the presenting part can be felt. The breech may be known from the head, by its soft and fleshy feel, and by the absence of sutures and fontanelles; it is not so round nor so hard as the head. Upon some part of the anterior surface will be felt the hard, resisting trochanter; passing the finger carefully around, the tuberosities of the ischia may be detected, also the fissure between the nates; at the bottom of this fissure are found the most important signs, as the sacrum, coccyx, anus, and external genital organs; and the anus may be detected from the mouth, by the difficulty, if not impossibility, of introducing the finger into it. The presence of the coccyx, not only assists us in determining the character of the presentation, but also that of the position, because its point or apex is always directed toward the side of the maternal pelvis corresponding with the child's abdomen. The presence of the meconium, which has been noticed by some writers as a diagnostic sign, is really of little value, as it is frequently met with in head presentations, and also occurs as a sign of the child's death.

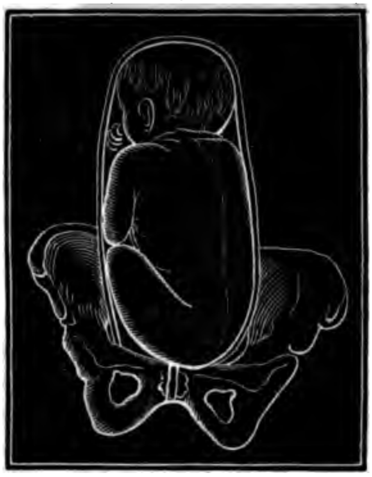
Having become positively certain that the breech presents, it should be named to the husband, nurse, or some relative, but great care must be taken to conceal it from the patient, lest it impart a shock to her mind which may suspend or retard the labor for several hours. The communication should be made to the husband in a separate room, and all the dangers to which the child is exposed, fully made known, so that in case it be still-born, the skill or ability of the medical attendant may not be called into question. Should the sex of the child have been ascertained during the examination, it must not be made known to any one, lest it reach the patient's ears, and effect an unfavorable influence over the progress of the labor, by the disappointment it might occasion should it be different from the one desired.

By a reference to page 286, it will be seen that four positions are given, in any one of which the breech may present; and which positions are ascertained by the coccyx, ischiatic tuberosities, genitals, etc., and named according to the situation of the back or sacrum of the child.

1. MECHANISM OF LEFT SACRO-COTYLOID POSITION.

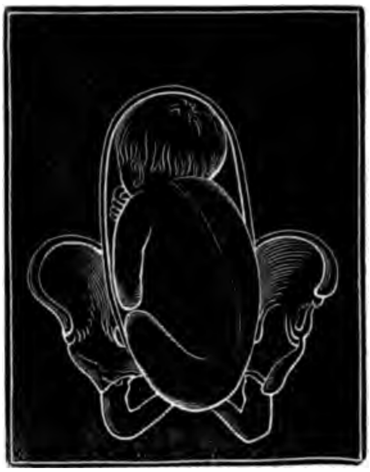
In this position the sacrum of the fetus faces the maternal left ilium anteriorly, while the hips or bi-trochanteric diameter are parallel with the right oblique diameter of the superior strait, or, with its antero-posterior diameter; the abdomen, and posterior part of the fetal thighs flexed upward, are toward the right ilium posteriorly, its left side is in front, and its right side to the back of the mother; the head is slightly flexed on the chest, and inclined to the right and posteriorly.

FIG. 57.



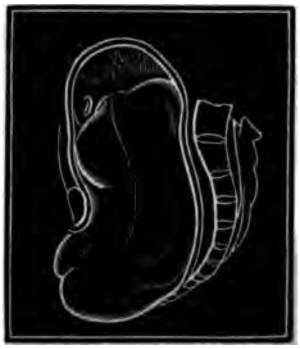
As soon as the membranes rupture, a large amount of the liquor amnii escapes, and the presenting part, which was previously high up, engages in the brim, and its position can now readily be ascertained. The hips usually engage in the direction of the antero-posterior diameter, but if the pelvis be small, or the child unusually large, they will take the direction of the right oblique diameter. (*Fig.* 57.) As the uterine contractions continue, the nates descend into the pelvic cavity until they arrive at the inferior strait, the left or anterior nates being the lowest. At this point rotation takes place, and the child's left hip is carried to the left, toward the pubis, while its right rotates to the right toward the hollow of the sacrum. (*Fig.* 58.) The left hip appears first at the vulva, under the symphysis pubis, maintaining its position there, while the right hip is made to gradually traverse the hollow of the sacrum, and inner perineal surface, describing an arc of a circle around the left hip as a center. In some cases the left hip, during this motion of the right, ascends behind the pubic symphysis.

FIG. 58.



While the right hip is passing over the posterior wall of the pelvis, the body

FIG. 59.



of the child becomes curved laterally on its anterior side, so as to accommodate itself to the curvature of the pelvic cavity. (*Fig.* 59.) This lateral curvature continues until the body is expelled; though as the parts are disengaged they recover their original position.

As the right hip advances toward the posterior commissure, the bis-iliac diameter of the fetus corresponds with the pelvic antero-posterior diameter, and the process of restitution takes place after the delivery of the pelvis, placing it in its original diagonal position; though frequently this oblique position is retained throughout delivery. The hips having been delivered, the fetal breast engages in the excavation, and as the body descends, the inferior extremities fall out. The shoulders are usually in an oblique position when they arrive at the inferior strait, provided they have not partaken of the rotation of the hips, as this movement may either be partial, or participated in by the whole body. When they are in the oblique diameter of the pelvis, rotation is effected, which places the left shoulder under the pubic symphysis, and the right in the sacral concavity; the left shoulder remains at the pubes, while the right passes over the anterior face of the sacrum, coccyx and perineum, when both are delivered. As is the case with the hips, the left shoulder sometimes ascends behind the symphysis pubis, during the passage of the right over the posterior pelvic wall, instead of appearing first at the vulva. If the shoulders descend in an oblique position, the right one will be to the left and back, and the left to the right and front, consequently rotation will carry the left shoulder from right to left. The right or posterior shoulder is generally delivered the first.

The arms are usually applied closely to the thorax, and are thus delivered; but it sometimes happens, that one or both of them get up along the sides of the head, rendering the delivery of the head very difficult, and requiring artificial interference. This may be occasioned by the smallness of the pelvis, or the unusual size of the child; but it more commonly arises from an imprudent traction made by the accoucheur on the pelvic extremity, in order to facilitate the delivery, and which improper interference may still further increase the difficulty of the labor, by effecting an extension of the head. In ordinary instances, where one arm has been thrown up by the side of the head, it will most commonly be the one behind the pubic symphysis.

While the shoulders are being disengaged, the head, usually well flexed upon the thorax, has entered the superior strait in the direction of its left oblique diameter, the forehead being toward the right sacro-iliac symphysis, and the occiput toward the left acetabulum, which flexion and diagonal position it retains until it has reached the inferior strait. At this strait, the relation of the pelvic diameters with those of the fetal head will vary according to the degree of flexion. If the flexion be moderate, the occipito-frontal diameter will be parallel to the left oblique of the strait, and the bi-parietal to the right oblique, while the trachelo-bregmatic diameter will very nearly correspond with the axis of the inferior strait. But if there be a greater degree of flexion, the sub-occipito-bregmatic will correspond with the pelvic left oblique diameter, and the axis of the lower strait will very nearly pass in the direction of the occipito-mental diameter.

Upon arriving at the inferior strait, the head undergoes the movement of rotation, by which the face is carried into the hollow of the sacrum, the occiput behind the symphysis pubis, and the neck under it; the sub-occipito-bregmatic diameter is placed nearly in correspondence with the pelvic antero-posterior. At this period, the head is nearly, or altogether in the vagina, and consequently the contractions of the uterus exert but little or no expulsive influence upon it; the further progress of the head is, therefore, to be effected by the contractions of the abdominal muscles. As the neck is situated firmly against the pubic arch, preventing the descent of the occiput, the contractions will occasion the head to become more and more flexed upon the chest, and while this motion is taking place, the chin, face, forehead, and posterior fontanelle, traverse the internal face of the sacrum and perineum, and successively appear in front of the posterior commissure of the vulva, while the occiput is the last delivered.

2. MECHANISM OF RIGHT SACRO-COTYLOID POSITION.

In this position the sacrum of the fetus faces the maternal right ilium anteriorly, while the bi-trochanteric diameter is parallel with the left oblique diameter of the superior strait, or, with its antero-posterior diameter; the abdomen, and posterior part of the fetal thighs flexed upward, are toward the left ilium posteriorly, its right side is in front, and its left side to the mother's back; the head is flexed and inclined to the left and posteriorly.

The mechanism in this position is precisely similar to the one just described, with the exception of an inversion of the relations of the parts. The right hip rotates from right to left, and is the one placed at the pubic arch, while the left traverses the posterior wall of the pelvis. The right shoulder rotates from left to right to reach the pubic arch, and the head engages in the cavity with the occiput toward the right acetabulum, and the forehead toward the left sacro-iliac symphysis.

3 and 4. MECHANISM OF SACRO-PUBIC, AND SACRO-SACRAL POSITIONS.

These positions are very rare, and are not recognized by some authors. When they do occur, they must be converted either naturally or artificially, into the first or second position, by rotation, or the labor cannot proceed.

TREATMENT OF BREECH PRESENTATIONS.

In all presentations of the pelvic extremity, the cases should be left to the natural powers, unless accidents occur imperatively calling for assistance, and this point can not be too strongly urged upon the student. The mere fact of a child being born, "*doubled up*," as in a breech presentation, does not necessarily presuppose interference, especially when we call to mind the diameters of the parts. The largest diameters of the fetal breech, as the bi-trochanteric and bis-iliac, are smaller than the bi-parietal diameter of the head, or the bis-acromial diameter. When a presentation of this kind is met with, no attempts should be made to bring down the feet and inferior extremities, unless there be proper cause for so doing; to do otherwise is bad and meddlesome practice. When the breech descends with the limbs flexed upon the abdomen, the labor proceeds slowly, in consequence of the yielding character of the presenting parts, which, not being firm and resisting, like the head, give way, to a certain extent, during each pain, and thus require a longer time to render the soft parts of the mother sufficiently yielding. But this protractedness in the delivery of the fetal pelvis, is rather to the child's advantage; for the maternal parts become so thoroughly dilated and yielding thereby, that the head passes without any difficulty, a few efforts of the patient being sufficient, in ordinary instances, to expel it shortly after the delivery of the shoulders. But, if the feet be imprudently brought down by an unskillful accoucheur, the smaller bulk offered to the soft tissues of the maternal generative parts, will not so completely dilate and adapt them to the easy passage of the head, which, in consequence, may be so long delayed in its expulsion as to occasion the death of the child.

Neither is it proper to employ any extracting force, for the purpose of facilitating delivery, as the child may be destroyed by a severe and arious extension of the neck; it being borne in mind that the neck of the child before birth is capable of sustaining no more extractive force than afterward, and any great amount of traction must injure the spinal marrow; beside, the arms not being maintained in their position by the contractions of the uterus, become arrested, and do not simultaneously participate in the descent accomplished artificially by traction; hence, as the head advances, they become placed on its sides, and greatly interfere with its expulsion during the last period of the labor. When the contractions of the uterus expel the child, the arms are born in the position originally assumed by them; but if traction be made, its influence is exerted only on the body, and there is invariably a tendency of the arms to rise along the sides of the head, because the pressure of the uterine fundus is then no longer exerted upon them to keep them in place. Consequently, it is bad practice in ordinary cases, to bring down the feet, as well as to attempt to hasten labor by making artificial traction.

In these preternatural cases, the physician should be more attentive to the progress of labor than in natural cases, being careful, however, not to alarm his patient by an unnecessary display of over-anxiety, or officiousness, nor to make any injudicious attempts to advance its progress during the early stage. During the escape of the breech from the vulva, the perineum becomes greatly distended, and it should be steadily supported in order to prevent the too rapid advance of the pelvic extremity, as well as to impart a motion to it in the direction of the inferior part of the pelvic axis, and without which movement much delay would be occasioned. Dr. Collins remarks: "The most critical part of the delivery, should much delay take place, is during the passage of the head, which pressing continuously on the funis speedily deprives the child of life. To guard against this, therefore, the breech should be permitted to pass slowly and unassisted, so as gradually and perfectly to dilate the soft parts, thereby greatly facilitating the completion of the labor." When the contractions of the uterus are sufficient to expel the fetus, however slowly, no interference whatever is required; it is only when the breech has so far advanced externally as to permit the cord to be reached, that any aid will be needed. The cord must be drawn down a little, in order to prevent it from being broken off, as well as to prevent its vessels from being stretched. The umbilical arteries of the cord run in a tortuous manner around the vein, and consequently, any stretching of the cord would, by diminishing their caliber, as effectually check the circulation, as from direct pressure of the head while in the pelvis; hence, by keeping a loop of the funis slack, we prevent any danger to the child from tension of the cord during the advance of the body. After the cord has been placed within reach, the necessity for interference can always be determined by the character of its pulsations; if these be strong, haste is not required; if they become feeble, irregular, or intermittent, assistance must not be delayed, and the body of the child may be brought down during a pain; if they have ceased, an indication of the child's death, the case should be left to nature. A soft napkin should always be wrapped around the child's body, as soon as the feet have been delivered, which will protect its surface from being injured, as well as enable the physician to hold it more firmly when performing any manipulation which may be required.

The passage of the shoulders through the external parts must be carefully attended to, and if they do not present favorably at the outlet, rotation should be made, to bring the proper one under the pubic arch, and the other into the cavity of the sacrum. If the arms remain by the side of the child, there will be no delay in the expulsion of the shoulder, but if they have become elevated, the advance of the shoulders and head will be very much, if not entirely, retarded. To obviate this, one or two fingers are to be passed along the arm, as near as possible to the elbow, when the elbow must be drawn downward, and forward across the face and chest, until it arrives at the outlet; one arm having been liberated, the other may be drawn down with but little difficulty. The easiest way of effecting the descent of the arms, is to begin with the one nearest to the perineum, and to draw downward, and anteriorly over the face and chest of the child; if the force be directly downward, or toward the back of the child, or be made with suddenness or violence, the arm may be broken or dislocated, and the soft parts of the mother be considerably injured. The blunt hook has been advised in these cases, but I see no necessity for it, as the arms may always be reached by the fingers.

The shoulders and arms having escaped, the situation of the head must be ascertained by an examination. During the progress of the labor the accoucheur must so mănage, if required, that when the head is in the pelvis, the face will be directed toward the hollow of the sacrum. This being the case, he will elevate the child's body toward the maternal abdomen, so as to bring the long diameter (mento-occipital) of its head in correspondence with the axis of the inferior strait; and should the chin have departed from the breast, he will introduce two fingers and place them upon the child's upper jaw, and by gentle pressure depress the chin upon the breast, thus facilitating the expulsion of the head by presenting a shorter diameter of the head to the inferior strait. At this time, the head, being freed from the uterus, is not influenced by its contractions, and the auxiliary aid of the abdominal muscles will be required to terminate the delivery; consequently, instead of waiting for a pain, the patient should be urged to bear down, that the head may be expelled, for any delay will endanger the life of the child, from the continued pressure of the head upon the cord. Assistance may likewise be given, by applying extractive force to the shoulders in the direction of the axis of the inferior strait, bearing in mind, however, that an excessive amount of such force, will seriously injure the child's neck. Should a delay in the passage of the head occur, the child may be frequently saved, by introducing a finger into its mouth to remove any mucus which may be there, and then "pass two fingers upward until they reach the two maxillary bones, and cover the nose; by doing this, the backs of the fingers, pressing the perineum backward, serve to keep an open communication with the air, and the child can breathe very well until the expulsive efforts come on." (*Meigs.*) This author also recommends the forceps to be within reach in all pelvic presentations, feeling well assured that he has saved several lives which would have been lost but for this precaution; I am satisfied that this course is not only wise and prudent, but that a resort to the forceps in all cases of delay in the delivery of the head, will result in benefit to both the child and mother. If, however, the child be dead, as known by the cessation of pulsation in the cord, and the head be very large, or some obstacle presents rendering it very difficult to extract with the forceps, the perforator may be introduced behind one or both ears, for the purpose of lessening the size of the head, and thus terminating the labor. The head being born, the rest of the labor will be managed as in natural labors.

When the uterine contractions become inefficient, previous to the expulsion of the breech, or when, from any cause, a quick delivery is demanded, one or two fingers may be passed up and hooked into the groin, and steady and gentle traction be made during the presence of a pain; the pains may, likewise, be rendered more efficient by the administration of four or five grains of Caulophyllin, which may be repeated every half hour, until the uterine contractions are sufficiently powerful. Sometimes a combination of Caulophyllin and Cimicifugin may be administered, but, on no account is Ergot to be given in a case of pelvic presentation. For the purpose of extracting the breech, the fillet and blunt hook have been recommended—these may sometimes be useful, but great care is required in using them, lest the thighs of the child be fractured. And it must never be lost sight of, that whenever extracting force is employed, it should always be made in the direction of the axis of the pelvic cavity, according to the part at which resistance is offered.

The most difficult cases of breech deliveries are those in which the sacrum of the child is directed toward the maternal sacrum, and rotation has not been effected; in consequence, when the head reaches the inferior strait, the face of the child will be to the pubis, and its occiput to the sacrum. This will occasion considerable difficulty in the delivery of the head, beside being a very dangerous situation for the child. A complete rotation of the child's body, so as to reverse the positions, and bring the face eventually to the hollow of the sacrum, must be produced, either spontaneously, or by the management of the accoucheur. In these sacro-sacral positions, when the breech is low in the pelvis, and not yet delivered, and rotation has not taken place, two or three fingers may be introduced for the purpose of forcing, by steady and continuous pressure, that hip which is situated the most anteriorly, toward the pubic symphysis; and the delivery of the hips being achieved in this position, they may be enveloped in a soft napkin, and as the pains expel the body, the accoucheur will gradually continue the rotation in such a manner, that the face will be in the desired position at the time it reaches the lower part of the pelvic cavity. And in effecting this change, should the pains urge the body too rapidly onward, he must, by counter-pressure, prevent its too hasty exit, until the rotation is satisfactorily accomplished.

Sometimes the body of the child will be held by the womb so forcibly, during a pain, that the rotation can not be performed; the practitioner should then operate during the absence of pain, first, pushing the child's body upward as far as possible, and then giving to it a compound movement, by drawing it downward and at the same time rotating it.

Should the head, however, have reached the inferior strait with the face to the pubis, the practitioner will cause the female to lie on her back, her hips being brought over the edge of the bed, and the feet supported on chairs by two assistants. As soon as the shoulders are delivered, an assistant will carry the body of the child backward, while the accoucheur will press the perineum back, with one hand, to prevent its forcing the throat against the pubis, and with the other he will bring down the chin, either by introducing two fingers into the mouth, or by placing them upon the upper jaw. The chin having been thus depressed, the woman must be urged to bear down forcibly, in order to facilitate the expulsion of the head. Should this method fail, the forceps will probably be required, or perhaps the perforator.

I have stated heretofore, that it is bad practice, in breech presentations, to bring down the feet; still, there may be instances where this will be demanded, and where it will become necessary, also, to employ some forcible traction, in order to expedite delivery. Thus, in cases where the breech is large and the pelvis narrow, it may be almost impossible for delivery to be effected, without some interference of this kind; accidents may also occur, at the *commencement of labor*, which, by jeopardizing the life of the mother, require a hastening of the labor, as in convulsions, hemorrhage, etc. But should these occur while the os uteri is undilated, temporizing and palliative measures only can be employed, and no attempts whatever should be made to introduce the hand within the uterus for the purpose of bringing down the feet.

Should these accidents occur when *the breech is low in the pelvis but still within the uterus*, we must be guided by the circumstances. If the os uteri be rigid, no attempts to introduce the hand must be made until the rigidity is overcome: if it be dilatable and in proper condition, the hand may be introduced, whether the membranes be ruptured or not, and the feet brought down.

If interference is demanded after *the breech has been expelled from the uterus*, the feet must not be brought down, unless the pelvis be large, or the breech be small, and unless the pains have ceased to be efficient. In this case, if the breech be very low in the pelvis, a finger may be passed above one or both groins, and during the presence of pain, traction may be made in the direction of the pelvic axis. If the breech can not be delivered by this means, the fillet may be employed, and if this cannot be applied, the blunt hook must be resorted to.

As remarked in a previous chapter, (*see page* 286), knee and feet presentations are mere deviations from the breech, the labors being more painful and difficult, with greater risk to the child, but requiring a similar management. When the knee presents, it may be mistaken for an elbow; but may be distinguished from it by the rounded patella with its flat surface, and which is more or less movable on the condyles of the thigh bone: the olecranon of the elbow is pointed and sharp—not flat, like the patella, and is not movable. Nægèle observes that the "knee is thicker, has two prominences, and a depression between them, while the elbow is thinner, and presents to the feel, between the two prominences, a projection in which it seems to end."

In knee presentations it is always advisable to convert them into footling cases, which may be effected by pushing the fetus upward during the absence of pain, so that sufficient space may be gained to bring down the feet.

A foot may be determined from a hand, by its rounded instep, its prominent heel, the toes being all in one line, and no one of the digits being an opponent to the others: the hand has no rounded instep, no prominent heel, the digits are not all in one line, there is a flattened palm, the fingers longer than the toes, not all of the same length, and the thumb opposed to the fingers. The foot is also longer than the hand, and its sole flatter, and the presence of the heel, with the ankle-bone on each side, will distinguish it from the hand and wrist.

In cases of breech presentation, various means should be in readiness, as a warm bath, etc., to resuscitate the child, should animation be suspended; its limbs and genitals should also be carefully examined before leaving it; and if they present appearances of injury, a fomentation of the flowers of St. Johns-wort may be applied, or some evaporating lotion.

Rigidity of the os-uteri, pelvic tumors or deformities, and other circumstances which may also be present in vertex presentations, occasioning difficult labor, must be treated as directed under the head of difficult labor.

CHAPTER XXXIII.

ON PRETERNATURAL LABOR.—SHOULDER PRESENTATIONS.

It is as difficult to assign a sufficient explanation of the cause of presentations of the superior extremities, as of those of the pelvic. They have been attributed to irregular distension of the uterus, to uterine obliquity, to irregular contractions at an early period of labor, etc., and they may have existed primarily. Dr. Rigby remarks: "We may, therefore, state that the causes of arm or shoulder presentations are of two kinds, viz: when the uterus has been distended by an unusual quantity of liquor amnii, or when, from a faulty condition of the early pains of labor, its form has been altered, and with it the position of the child." Still, these "cross-births," as they are often called, are involved in much obscurity; there appears to be a natural tendency to them with some women, who have them at every labor.

Previous to the commencement of labor, there are no positive signs by which we can determine a presentation of a shoulder, or of any part of the body; and no dependence can be placed in an unusual figure of the uterus, as ascertained by applying the hand over the abdomen. A transverse presentation of the fetus may be suspected when the os uteri dilates slowly, when the membranes protrude into the vagina in an elongated form, when the presenting part is beyond the reach of the finger, and when, after the rupture of the membranes, the pains cease for several hours. A vaginal examination will determine the correctness of our suspicions, as well as inform us of the position; and both of these points should be satisfactorily ascertained before any interference is attempted by the practitioner.

I have already remarked, on page 285, that there are two positions for each shoulder, viz: FIRST LEFT CEPHALO-ILIAC, and FIRST RIGHT CEPHALO-ILIAC of the RIGHT SHOULDER, and SECOND LEFT CEPHALO-ILIAC, and SECOND RIGHT CEPHALO-ILIAC of the LEFT SHOULDER; and to which the reader is referred for an explanation of the situation of the child in these several positions.

DIAGNOSIS. — Previous to the rupture of the membranes, the presenting part is commonly elevated beyond the reach of the practitioner's finger, but it may always be felt after they have given way; and then a careful examination should be made, that no doubts may exist with regard to the nature of the case. This should be satisfactorily accomplished, in all instances, immediately after the membranes have ruptured, and if necessary, a part of the hand, or even the whole of it, should be introduced into the vagina, for the purpose of making a correct diagnosis. Should the presenting part be an elbow or hand, it may be felt offering at the mouth of the uterus *before* the rupture of the membranes; and sometimes, after a hand has been clearly detected at the os uteri, it has subsequently become withdrawn, and the vertex found presenting. The *shoulder* may be known from the head, by its being less bulky, less firm and resisting, and by the absence of sutures and fontanelles; from the breech, by the absence of the anus and parts of generation, and by being not so large and less fleshy. The finger, on coming in contact with it, first detects the projecting acromion, in front of which will be felt the clavicle, below which the ribs and intercostal spaces will be readily made out; then carrying the finger behind the acromial process, the spinous process of the scapula will be detected, the surface inferior to it will be found plane and smooth, terminating below in the acute inferior angle of the scapula, which is movable and will permit the finger to pass under it. The arm may also be felt and distinguished from the thigh by its size, and sometimes the depression in the neck can be recognized.

Having ascertained the case to be a shoulder presentation, the next and most important point is to determine which shoulder presents, and its position. If this can not be ascertained at an early stage of the labor, it always can in time to be remedied, and that is, when the dilatation will admit; this may be effected by ascertaining where the fetal head lies, and the situation of its back. The side to which the head is directed may be known by the axilla, which must always look in an opposite direction to that of the head; thus, if the axillary space looks toward the left ilium of the mother, the fetal head will be to her right ilium, and vice versa. The direction of the back may be known by the scapula and vertebræ behind, and the clavicle, ribs, and intercostal spaces before. Should there be the least doubt relative to these points, the practitioner should not hesitate to bring down an arm in order to assist him in his diagnosis, as it will occasion no difficulty in the operation of turning; but in effecting it, great care should be taken not to make the slightest traction upon the fetus.

When the *elbow* presents, it may be recognized by three bony prominences, viz: the olecranon and the two condyles, and by the bend of the elbow occasioned by the flexion of the fore-arm upon the arm. The position of the fetal head may also be known readily, being always toward the side opposite to that in which the elbow is directed; and the fore-arm usually rests upon the anterior surface of the child's body, as just remarked above. I repeat, should there be the least doubt as to the position, or the presentation, and provided the membranes have ruptured, the arm may be carefully brought down, making no traction whatever, upon the fetus. To distinguish a knee from an elbow has already been explained on page 391.

Sometimes a *hand* will hang down in the vagina, or even out at the vulva, and may be mistaken for a foot. (*See page* 391.) If the young accoucheur will accustom himself to feel and handle the various parts of a newly-born child, as the feet, knees, hands, elbow, shoulders, etc., he will acquire a ready tact in diagnosticating, which will prove greatly advantageous. We may learn which shoulder presents, by the hand. If the palmar surface be found directed toward the pubic symphysis, the thumb turning to the right side of the maternal pelvis, it is the right hand, and consequently a presentation of the right shoulder; if the thumb turn to the left side, it is the left hand, and a left shoulder presentation. If the dorsal surface or back of the hand be directed in front, the thumb being toward the right side of the pelvis, it indicates the presence of the left hand and shoulder; if the thumb be toward the left side, it is the right hand and shoulder presenting. The head is always in the direction of the thumb; thus, if the thumb be toward the left side, the head will be in the left iliac fossa, and vice versa; if the palmar surface of the hand be in front, the child's face will be looking toward its mother's abdomen; if the dorsal surface be in front, the back of the child will be toward the maternal abdomen.

Having ascertained that the presentation is of the shoulder, the practitioner should immediately inform the husband or friends that it is a "cross birth," and explain to them, without any reserve, the necessity for interference, and the hazards to the child as well as to the mother. Whenever it is possible, council should be had, that the friends may be thoroughly satisfied, and also that no subsequent censure may be attached to the attendant, should serious consequences result. The patient should, likewise, be informed that labor cannot proceed without artificial aid, and the reason made known to her; and this should be done in a kind and gentle manner, carefully avoiding any discouraging word, look, or action. But this communication should not be made to her, until we are about to commence attempting the version.

TREATMENT OF SHOULDER PRESENTATIONS.

When a shoulder presentation is suspected or ascertained previous to the rupture of the membranes, and before the os uteri is sufficiently dilated, every means should be used to preserve the membranes entire; examinations should be made with care, and the female should be kept in a horizontal position. No attempts whatever should be made to force the hand into the os uteri until it is dilated or dilatable, and even then, not until the position is satisfactorily determined. In the meantime, the rectum should be evacuated by the administration of a mild, emollient enema, if necessary, and the bladder by a catheter; for the operation of turning, which is the one usually recommended and pursued in these cases, should never be undertaken until these evacuations have been effected either naturally or artificially.

As soon as the os uteri has become dilated to the size of half a dollar, it being also, together with the vagina and soft parts, perfectly soft and yielding, the membranes remaining entire, the practitioner may carefully proceed to effect the operation of turning the child. This is, in fact, the most favorable period for the operation, as the presence of the amniotic fluid within the cavity of the uterus not only admits a ready introduction of the hand, but, by floating the child, permits it to be turned in any direction. The practitioner cannot be too careful as to the time when he enters a hand into the uterine cavity: if he makes the attempt at too early a period, the most lamentable results will follow; if it be too long delayed, the hazards and difficulties are increased, and the patient suffers uselessly.

The position and presentation having been ascertained, the os uteri dilated, soft and yielding, with no rigidity of the soft parts, and the practitioner having waited for a period consistent with the integrity of the membranes and the preservation of the liquor amnii, it would be unwise to wait until the complete dilatation of the os uteri. The rectum and bladder of the patient having been previously evacuated, she must be placed on her back, across the bed, which is by far the most desirable position, with her hips brought a little over its edge, her feet resting on two high stools, or properly supported by assistants, so as to flex the limbs well, and thus favor a relaxation of the abdominal muscles. She should by no means be exposed, but should be covered by some bed-clothing, suitable to the temperature of the season, and, for the purpose of receiving the discharges, a thick layer of cloths should be placed on the floor, immediately beneath her.

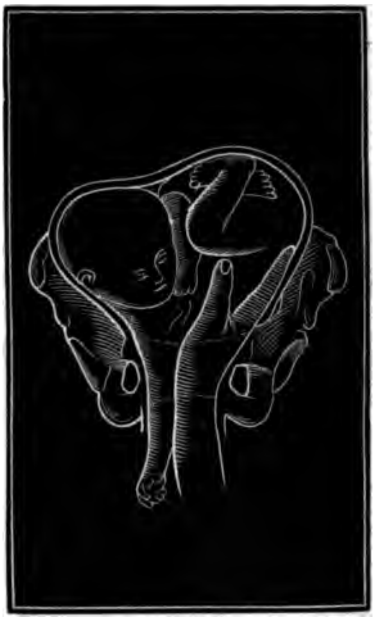
The practitioner will now remove his coat, bare his arm to the elbow, and anoint it well with sweet oil, or lard; the vagina should also be similarly anointed. To protect himself from the discharges, a sheet or apron may be worn over his dress. Everything thus prepared, he will take his seat, at a convenient distance for operating, between the patient's limbs; and throughout the whole operation, he should be cool and deliberate, manifesting no haste, excitement, trepidation, nor hesitation.

There is some choice of the hand to be introduced — that one should always be used which can the most conveniently effect the version; and the common rule is, to use the hand whose palmar surface would, when opened within the uterine cavity, be directed to the anterior surface of the child's body. Should the child's hand present, this may readily be ascertained by grasping it as in shaking hands, and that hand should be used, the palm of which comes in contact with the fetal palm.

It is not unfrequently the case, that the contractions of the uterus so completely benumb the hand which has been first introduced, that the accoucheur being unable to use it, is compelled to withdraw it, and employ the other. Dr. Lee advises us, in all cases, no matter what the situation of the trunk and extremities, to pass the hand up between the anterior and shallow part of the pelvis, and the presenting part of the child.

The proper period for passing the hand *within the vagina*, *is during a pain;* the fingers may be held together, in a conical form, and thus slowly introduced, or, two fingers, then three, four, and lastly the thumb strongly flexed into the palm, may be passed within the vulva; while passing the vaginal sphincter considerable pain will be produced, but this will be materially, if not entirely, lessened, after the hand has entered the vagina. The hand may now rest stationary for a short time, to produce toleration of its presence, as well as to dilate the parts. Its introduction *within the uterine cavity, must be during the absence of pain;* an attempt to pass it within the womb, during a pain, would probably rupture the membranes, and allow the amniotic fluid to escape before the vagina was sufficiently plugged up by the arm to prevent it. The fingers are to be passed within the os uteri in a conical form, and carefully and gently pushed upward until the hand is fully within the uterine cavity. If the presence of the hand has not excited uterine contractions, followed by rupture of the membranes, the bag of waters should rest on the hand, and be passed up as far as possible, before rupturing them; the presenting part should also be pushed upward and to the left or right, according as the head may be on the left or right side of the uterus. (*Fig.* 60.) While the hand is entering the os uteri, the uterus should be kept steady by the other hand of the operator, or, what is much better, an assistant should place his hand on the abdomen, over the fundus of the womb, to steady the organ, and at the same time to maintain a gentle pressure downward, to keep the os uteri within the strait. Usually, the membranes give way as the hand is passing within the uterine cavity, even before the feet are reached, in which case the hand and arm must be pressed firmly forward to plug up the orifice, lest the amniotic fluid escapes, thereby causing the version to be more difficult.

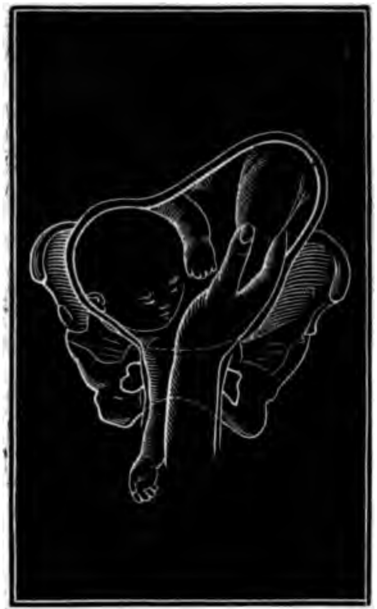
FIG. 60.



Should a pain come on during the entrance of the hand into the uterus, it must be kept perfectly still, and when within the cavity of the womb, it should be opened and made to cover the body of the child whenever uterine contractions come on; for any attempts at moving, or resisting the action of the organ at this time, might occasion its rupture. The membranes having been ruptured, the hand enters into the cavity of the ovum, along the anterior surface of the child, and should be passed up to the umbilicus where the funis will be felt, and in the neighborhood of which a foot will generally be found. Having reached a foot, secure it between two fingers, and search for the other; and if the contractions come on, the hand must be opened, and clasped over the child's body. If, after a reasonable time, the other foot cannot be found, the version may be accomplished by the one foot, being certain, however, that it is a foot, before attempting the change. Frequently, the contractions of the uterus are so severe that the hand of the operator becomes cramped, numbed, or extremely painful, and its nicer tact of feeling becomes so impaired, that, without the greatest care, he may confound a hand with a foot. On this point be exceedingly cautious. We are advised by Dr. Radford, of Manchester, Eng., who has had much experience in difficult cases of obstetrics, "never to bring down more than *one foot* in the manual operation of turning; because the other thigh, being flexed upon the abdomen, offers a larger circumference than if it were extracted, and thus prepares the passages for the more easy transit of the shoulders and head. The advantage of this practice consists in its affording greater safety to the child; the disadvantage, in its creating more difficulty in accomplishing the evolution." (*Ramsbotham.*) Prof. Meigs, who is the highest obstetric authority in this country, observes in his Obstetrics: "at length, after more or less research, one or both feet, or a knee is found; and whether it be one or the other, it should be taken hold of; for it is nearly a matter of indifference whether it be one foot or both, or one knee that is used as the point on which to act in turning the child. Dr. Collins, p. 69, remarks, on this point, that 'it is quite sufficient to bring down one foot,' and I find that Dr. Simpson of Edinburgh, is of the same opinion—deeming it far more injurious to make perverse attempts at exploration, than to deliver by one foot only. I say, nearly a matter of indifference, because, the object being to turn the child as soon as practicable, with proper caution it may be effected in either of these ways: it is always desirable to get the hand out of the uterus as soon as may be, and it is far better to turn by one foot, or by a knee, than to incur the risk of laceration or contusions of the organ, by a tedious search after the other foot, which, if it be not originally near its fellow, is very hard to be found by any search for it. The inexperienced student can have little notion of the extreme difficulty there is to move the hand about while it is compressed betwixt the womb and the child; a short experiment of this difficulty would suffice to convince him of the propriety of the foregoing directions. If he should use the knee as a point of traction, it would be very easy, when the version is nearly complete, to draw the foot down. If he use only one foot to turn by, he will have nearly all the proposed advantage of the breech presentation, combined with the greater facility enjoyed in manipulating in the footling case—that is to say, he will have the abundant dilatation, and the power of traction by the limb. It sometimes happens, that a foot is met with close to the orifice; so that, even without carrying the hand within the uterus, the foot can be hooked down by means of one or two fingers, as has been done by Dr. Robert Lee, of London." It will thus be perceived, that the most eminent accoucheurs of this country and Great Britain, are opposed to any lengthy search after both feet, in cases of turning, and my own experience is in favor of performing version by one foot, when there is any considerable delay or difficulty in securing both.

If it be possible to select a foot, we should take that which is opposite to the presenting hand or elbow, and which will be situated more toward the anterior part of the pelvis. The period for effecting the version, is during the absence of pain, and any attempts to turn during a pain will not only be found nugatory, but may be productive of serious consequences. While the pains are off, the uterus will be found soft and yielding, and the operation may be effected with less danger; the version should be made over the anterior and not the posterior surface of the child, holding the limb or limbs firmly, and slowly and gently drawing them down into the vagina, and, if possible, to the external orifice. (*Fig.* 61.) Should the uterus contract, the operator must cease his efforts, and if the pain be severe, it may be necessary for him to straighten out the hand and let the foot go, recovering it after the pain has subsided. He should place his unoccupied hand externally on the patient's abdomen, and aid in accomplishing the version by pushing the child's breech downward, while he is making traction with the other hand. As the arm is gradually withdrawn, the amniotic fluid will gush out, and soil the dress of the operator, if he has not previously protected it by a covering.

FIG. 61.



The version having been completed, the patient may be carefully placed in bed, leaving the rest of the labor to the natural efforts, and managing it as directed in breech and feet presentations, page 386, being particular to have the child's face in the hollow of the sacrum when the head arrives at the lower strait. Some obstetricians recommend to terminate the delivery by a continuation of artificial efforts, gently and cautiously extracting the body whenever the pains are on; but I consider this as meddlesome and very improper; no such attempt should be made, unless circumstances are present demanding them.

After the delivery of the placenta, the female should be properly bandaged, put to bed, and a soothing preparation administered, as eight or ten grains of the compound powder of Ipecacuanha and Opium, combined with three or four grains of Capsicum,—the addition of the Capsicum, while it does not interfere with the soothing influence of this powder, tends to lessen any disposition to hemorrhage which may be present; or twenty or thirty drops of Laudanum may be exhibited; or a solution of Morphia in proper quantity; she should also be kept quiet and free from noise and company, and if possible, take a short sleep. Some gruel may be allowed, if requested.

The operation of turning, no matter how skillfully performed, is always a dangerous one for the mother, and should be performed with the greatest care and gentleness; any hasty or careless pushing, any thrusting of the knuckles in opposition to the contracted womb, any attempts at version during a pain, may occasion laceration of the vagina, rupture of the uterus, or, perhaps, both of these may occur. "If, under your attempts to turn, you feel any fibers giving way, whether in the womb or vagina, withdraw the hand immediately." (*Blundell.*)

Unfortunately, however, preternatural presentations do not always present the same features. It is frequently the case that the membranes will have prematurely ruptured, and the os uteri will not be sufficiently dilated; or, when fully dilated, there may be violent pains, with rigidity and irritation of the parts. In these instances no attempts whatever must be made to force the hand within the uterus, as they will only tend to increase the difficulty. Dilatation must be aided by the internal use of tincture of Gelseminum, in two or four-drachm doses, the compound tincture of Lobelia and Capsicum, or a combination of these, three parts of the former to one of the latter; vaginal emollient injections with or without Laudanum, according to the nature of the case, may likewise be exhibited, and in some instances the warm bath, or warm hip-bath, will be found very beneficial. I have found fomentations to the vulva, of Hops and Lobelia combined, very useful to aid in the relaxation of the parts. Chloroform has been advised in these instances, or Ether, inhaled to produce complete anæsthesia, and this will, undoubtedly, be found of advantage, by removing the voluntary efforts of the mother, especially the actions of the diaphragm and abdominal muscles—though, it must be recollected, that the most profound anæsthesia does not completely check the contractions of the uterus.

Bleeding, *ad deliquum animi*, is the practice most commonly advised in these cases, and there is no doubt but that it will generally produce the desired relaxation, but I am decidedly opposed to it, because its after effects upon the patient are frequently irremediable; it induces a debility of the nervous and vascular systems, which, if ever positively recovered from, will require months and even years of proper treatment to accomplish; it occasionally fails to effect the desired relaxation; and should hemorrhage, or other symptoms come on after venesection, there may not remain sufficient energy or vitality in the system to successfully oppose a fatal result. On the other hand, the desired relaxation can always be effected by the tincture of Gelseminum, or its combination with the Lobelia and Capsicum tincture, by which all rigidity will be overcome, the pulse will be lessened, abnormal heat and tenderness of the parts alleviated, and no strength of the patient actually lost; and should symptoms occur requiring an opposing force of the system, the patient may readily and permanently be restored to her usual vigor, by the employment of stimulants.

No haste is required in these cases—viz: when the os is not dilated, with premature rupture of the membranes, or, when it is fully dilated, the waters having been discharged, and the pains violent—the safety of the mother is the grand object, and patience is required on the part of the practitioner, together with cool, calm, and deliberate action. As soon as the parts are in proper condition, the hand may be introduced, and version effected as before explained. In these cases, where the waters have been discharged, it is better to turn by a knee, than allow the hand to remain too long within the uterus searching for a foot. When the pains are very violent, and the uterus contracts firmly about the body of the child, the tincture of Gelseminum should be given, combined with a sufficient quantity of Laudanum, which will commonly arrest the powerful action of the organ, and at the same time produce considerable relaxation of it, as well as of the soft parts, so that the hand can be introduced; I have likewise found that the tincture of Gelseminum three parts combined with the tincture of Aconite root one part, and administered in doses of ten or twenty drops, every half hour or hour as the case may require, will overcome the powerful contractions of the uterus, lessen the pains materially, and render the organ more yielding; and it is more especially in these instances where a resort to anæsthetics is advised. Of course, in these cases, the hazard to the child is always much greater. Sometimes, although the foot descends into the vaginal cavity, yet the shoulder being wedged in the pelvic brim does not recede, and the more forcible the traction is upon the foot, the more firmly does the shoulder become fixed in the brim, while the breech will not pass down. In these cases, a noose of strong tape or ribbon must be fixed round the ankle of the foot in the vagina, upon

After the delivery of the placenta, the female should be properly bandaged, put to bed, and a soothing preparation administered, as eight or ten grains of the compound powder of Ipecacuanha and Opium, combined with three or four grains of Capsicum,—the addition of the Capsicum, while it does not interfere with the soothing influence of this powder, tends to lessen any disposition to hemorrhage which may be present; or twenty or thirty drops of Laudanum may be exhibited; or a solution of Morphia in proper quantity; she should also be kept quiet and free from noise and company, and if possible, take a short sleep. Some gruel may be allowed, if requested.

The operation of turning, no matter how skillfully performed, is always a dangerous one for the mother, and should be performed with the greatest care and gentleness; any hasty or careless pushing, any thrusting of the knuckles in opposition to the contracted womb, any attempts at version during a pain, may occasion laceration of the vagina, rupture of the uterus, or, perhaps, both of these may occur. " If, under your attempts to turn, you feel any fibers giving way, whether in the womb or vagina, withdraw the hand immediately." (*Blundell.*)

Unfortunately, however, preternatural presentations do not always present the same features. It is frequently the case that the membranes will have prematurely ruptured, and the os uteri will not be sufficiently dilated; or, when fully dilated, there may be violent pains, with rigidity and irritation of the parts. In these instances no attempts whatever must be made to force the hand within the uterus, as they will only tend to increase the difficulty. Dilatation must be aided by the internal use of tincture of Gelseminum, in two or four-drachm doses, the compound tincture of Lobelia and Capsicum, or a combination of these, three parts of the former to one of the latter; vaginal emollient injections with or without Laudanum, according to the nature of the case, may likewise be exhibited, and in some instances the warm bath, or warm hip-bath, will be found very beneficial. I have found fomentations to the vulva, of Hops and Lobelia combined, very useful to aid in the relaxation of the parts. Chloroform has been advised in these instances, or Ether, inhaled to produce complete anæsthesia, and this will, undoubtedly, be found of advantage, by removing the voluntary efforts of the mother, especially the actions of the diaphragm and abdominal muscles—though, it must be recollected, that the most profound anæsthesia does not completely check the contractions of the uterus.

Bleeding, *ad deliquum animi*, is the practice most commonly advised in these cases, and there is no doubt but that it will generally produce the desired relaxation, but I am decidedly opposed to it, because its after effects upon the patient are frequently irremediable; it induces a debility of the nervous and vascular systems, which, if ever positively recovered from, will require months and even years of proper treatment to accomplish; it occasionally fails to effect the desired relaxation; and should hemorrhage, or other symptoms come on after venesection, there may not remain sufficient energy or vitality in the system to successfully oppose a fatal result. On the other hand, the desired relaxation can always be effected by the tincture of Gelseminum, or its combination with the Lobelia and Capsicum tincture, by which all rigidity will be overcome, the pulse will be lessened, abnormal heat and tenderness of the parts alleviated, and no strength of the patient actually lost; and should symptoms occur requiring an opposing force of the system, the patient may readily and permanently be restored to her usual vigor, by the employment of stimulants.

No haste is required in these cases—viz: when the os is not dilated, with premature rupture of the membranes, or, when it is fully dilated, the waters having been discharged, and the pains violent—the safety of the mother is the grand object, and patience is required on the part of the practitioner, together with cool, calm, and deliberate action. As soon as the parts are in proper condition, the hand may be introduced, and version effected as before explained. In these cases, where the waters have been discharged, it is better to turn by a knee, than allow the hand to remain too long within the uterus searching for a foot. When the pains are very violent, and the uterus contracts firmly about the body of the child, the tincture of Gelseminum should be given, combined with a sufficient quantity of Laudanum, which will commonly arrest the powerful action of the organ, and at the same time produce considerable relaxation of it, as well as of the soft parts, so that the hand can be introduced; I have likewise found that the tincture of Gelseminum three parts combined with the tincture of Aconite root one part, and administered in doses of ten or twenty drops, every half hour or hour as the case may require, will overcome the powerful contractions of the uterus, lessen the pains materially, and render the organ more yielding; and it is more especially in these instances where a resort to anæsthetics is advised. Of course, in these cases, the hazard to the child is always much greater. Sometimes, although the foot descends into the vaginal cavity, yet the shoulder being wedged in the pelvic brim does not recede, and the more forcible the traction is upon the foot, the more firmly does the shoulder become fixed in the brim, while the breech will not pass down. In these cases, a noose of strong tape or ribbon must be fixed round the ankle of the foot in the vagina, upon which traction may be made with one hand, in the direction of the pelvic axis, while the other, with the ends of the fingers placed against the ribs or axilla, must make at the same time, a steady, upward pressure, by means of which, the shoulder will be dislodged, affording by its recession, a space for the descent of the breech. The rest of the delivery is then terminated as in the before-named instances.

In cases of shoulder presentation where the arm has descended, it should never be returned within the uterine cavity, unless in attempting cephalic version, as referred to hereafter. The presence of the arm, assists the practitioner in forming his diagnosis as to position, etc., and never interferes with the introduction of the hand for the operation of turning. A piece of ribbon may, however, be attached to the wrist for the purpose of preventing the arm from rising alongside of the head after the version is accomplished, and thus avoiding any difficulty in its delivery. Any pulling or twisting of the arm is highly censurable; pulling at the arm will not assist the least in the delivery of the child, and twisting or amputating it has been performed on several occasions, in which the children were subsequently born alive, and some of whom lived to advanced age, in this mutilated condition. Should any cause be present demanding the removal of the prolapsed arm, it should always be made known to the relatives together with the reasons, previous to any attempt at the mutilation.

It will sometimes be the case, that notwithstanding our treatment, the contractions of the uterus will continue powerful and almost unremitting, obstinately resisting the slightest attempts to introduce the hand; in such instances, the only method is to wait, in the hope that spontaneous evolution may expel the fetus; but if it be dead, as known by auscultation, or if symptoms of sinking or exhaustion appear, we should proceed at once to remove the child by exvisceration. In these instances, the child will generally be dead before interference will be required, and the grand object of the practitioner, must always be, to save the mother's life, if possible. In many instances the mixture of the tinctures of Gelseminum and Aconite root, previously referred to, will be found very successful in overcoming this excitable condition of the uterus. And when the stomach is also irritable, rejecting almost everything exhibited, a combination of the tinctures of Gelseminum and Opium, or Morphia, will frequently prove useful.

SPONTANEOUS EVOLUTION, is an idea, which was advanced by Denman in 1772, who noticed that the labor, in shoulder presentations, where the liquor amnii had long been discharged, occasionally terminated by the natural efforts, the breech being expelled first, and who, consequently supposed, that the efforts of the uterus gradually turned the child so as to cause the shoulders to rise as the breech descended. In 1811, Dr. Douglas of Dublin, showed that this view was not correct, but that the fetus instead of being turned was actually expelled doubled up. His description of the occurrence, which he has more correctly named "spontaneous expulsion," is, according to Ramsbotham, as follows: "By the continuance of the powerful uterine contractions, the whole of the arm is protruded externally, the shoulder and chest being propelled low into the pelvic cavity. The acromion then appears under the symphysis pubis; and as the loins and breech descend into the pelvis on one side, the apex of the shoulder is directed upward toward the mons veneris. Further room is thus gained for the complete reception of the breech into the cavity of the sacrum, and that part of the child's body is eventually expelled, sweeping the sacrum, and distending the perineum to a vast extent. As, during the whole of this process, the head remains above the pelvic brim, it is evident that the apex of the shoulder being external, the clavicle must be strongly pressed against the under surface of the symphysis pubis; on which point, indeed, the fetal body partially revolves, as on an axis; the other shoulder and arm, and the head, being expelled last."

Spontaneous evolution, or spontaneous expulsion, seldom happens, being more common in premature labors, and is always fatal to the child, and exceedingly dangerous to the mother; the intense and protracted sufferings which the mother undergoes are beyond description, and no practitioner should ever trust to a delivery by this method, unless under the circumstances heretofore named, viz: where every other resource fails. Beside, it is exceedingly doubtful whether this spontaneous action will ensue at all, except when the fetus is very small, or the pelvis much larger than ordinary. Dr. Douglas says: "If the arm of the fetus should be almost entirely protruded, with the shoulder pressing on the perineum; if a considerable portion of its thorax be in the hollow of the sacrum, with the axilla low in the pelvis; if, with this disposition, the uterine efforts be still powerful, and if the thorax be forced sensibly lower during the pressure of each successive pain, the evolution may with great confidence be expected." A labor in which spontaneous evolution is effected, requires unparalleled voluntary efforts on the part of the female, and is always accompanied with extreme bodily and mental suffering, frequently occasioning death, either before, or soon after delivery; and should the patient survive, she is commonly left with some incurable difficulty, which renders life anything but desirable. Velpeau states that, in one hundred and thirty-seven labors of this description, only twelve children were born alive.

EXVISCERATION, should be resorted to only as a last resource, and should be employed in those cases where the membranes have been ruptured for several hours, with no advance of the labor, and also in instances where the child's body is firmly wedged at some part of the pelvis, rendering the introduction of the hand impossible or extremely dangerous. In performing this operation there is no necessity for amputating the arm, but an assistant will make traction upon it, for the purpose of bringing as much of the child's thorax into the pelvis as possible: the operator will then pass two fingers of the left hand upward within the vagina, until he feels one of the intercostal spaces, selecting a point as near the axilla as he can; the perforator is then to be passed along these two fingers, and a free opening made with it in the selected intercostal space. As it will be necessary to introduce the hand within this opening, and into the cavity of the fetal thorax, for the purpose of removing its contents, the operator may divide one or more ribs, so that the opening will be sufficiently large. After the removal of the thoracic contents, the diaphragm may be perforated, and the liver and intestines extracted. The removal of these organs will occasion a collapse of the body, which will be expelled doubled up, if the uterine contractions are sufficiently energetic, without any further interference; but if the pains are weak and inefficient, or have entirely ceased, the delivery must be artificially accomplished by the crotchet, removing rib after rib, hips, buttocks, etc.; or the instrument may be "carried through the opening and fixed within the fetal ilium; the breech will soon be observed to descend, and the case will be terminated as though nature had expelled the child unaided."

Ramsbotham refers to an operation for *decapitating* the child, in transverse presentations, when turning is impracticable, and when the neck is directly over the brim: fortunately, I have never had occasion to resort to it. He recommends the finger to be passed around the neck, a large-sized blunt hook to be introduced upon it, and the presenting part to be then brought as low into the pelvis as is consistent with the woman's safety. The hook must then be steadied by an assistant, while the operator introduces the decapitator (a hook with an internal cutting edge) by the side of the blunt hook: this latter is then removed, and the finger of the left hand being kept constantly in contact with the blunt point of the cutting hook, a sawing motion is communicated to it by means of the right hand, and the separation is thus effected; after which the child's body may be drawn out by the protruding arm, and the head removed by a crotchet or blunt hook, introduced into the mouth or the foramen magnum. These operations, of course, are only to be performed when the child is dead, and which will almost always be the case before a resort to them will be sanctioned by a skillful accoucheur.

In cases of shoulder presentation, CEPHALIC VERSION has occasionally been attempted, in which the presenting part has been pushed away and the head brought to the brim; but the operation has not received the sanction of many obstetricians, on account of the difficulties attending it. Prof. Meigs, in his work on Obstetrics, remarks: "It may be that those old practitioners of the days of Queen Elizabeth may have sometimes succeeded, by pushing up the presenting shoulder, in getting the head at last to come to the strait again, but such an event appears to me in any case most improbable." Prof. Miller observes: "Cephalic version has but few advocates at the present day, and is confessedly applicable to such a limited number of cases, that it is scarcely worthy of our formal consideration."

It will thus be seen that authors generally agree in considering cephalic version, at best, a doubtful expedient, and one to be attempted only as a dernier resort in some particular instances; yet, notwithstanding the observations of the above gentlemen concerning this operation, and the disrepute in which it is held, Dr. M. B. Wright, a talented and skillful physician of Cincinnati, formerly Professor of Obstetrics in the Ohio Medical College, has made known a method of cephalic version, which, I think, will become the more general practice in the management of shoulder presentations as it becomes better known: since having perused his essay, I have tried his method in two cases, and was highly pleased at the successful results. Dr. Wright's essay was on "Difficult Labors and their Treatment," and was read before the Ohio State Medical Society at one of their meetings, who awarded a gold medal to him. In order that my readers may understand his views, I will give his own language and quote freely from his essay. After describing several cases treated successfully, he remarks: —

"Now after all this, are we not justified in declaring —

"1. That at an early period in labor, and especially if called before the uterus has been deprived of its liquid contents, a shoulder may be converted into a vertex presentation more easily than turning by the feet is ordinarily performed.

"2. That although the membranes may have been long ruptured, turning by the head can be accomplished with great facility.

"3. That delivery by *cephalic version* may be speedily effected, after repeated and ineffectual efforts have been made to turn by the feet.

"4. That *cephalic version* should receive a prominent, nay, leading place, as a means of expediting delivery in shoulder presentations.

"The second of the questions already proposed is, what mode of proceeding will prove most favorable for the mother?

"In his chapter on podalic version, Churchill observes: 'On the other hand, its disadvantages are not to be overlooked. From the distance the head has to traverse, and the difficulty of seizing the feet, and of turning the child in utero, there must ever be a fearful risk of injury to the mother.'

"Upon an examination of the tabular views given by Lee, we find that out of seventy-one cases of shoulder presentations, in which turning by the feet was resorted to, 'seven women died from rupture, and three from inflammation of the uterus!' Laceration and inflammation of the uterus are, therefore, the consequences chiefly to be dreaded. Four of these cases of rupture occurred in the practice of other accoucheurs, and three in patients under my own care, and where no great difficulty was experienced or force employed in turning.' ° ° °

"In *cephalic version* the hand does not enter the cavity of the uterus, and, consequently, neither its walls, nor any portion of them, are forcibly pushed out. The fetus is moved comparatively little within the uterus, the head being already near the superior strait; while in *podalic* version the part to be first delivered is most remote from the canal through which it must pass. In the former, the injury to the mother can not result without great awkwardness on the part of the obstetrician, while in the other we have reason to feel surprised at the escape from injury. In turning by the feet, the hand must necessarily be moved considerably within the uterus, and often while it is contracting violently. In turning by the head there is but little, if any, direct contact of the hand within the uterus. In the one case, contusion of the uterus by the hand is to be expected; in the other case there is no injury, because there is no contact. Turning by the feet may occasion a severe nervous shock: not so in changing the shoulder for the head.

"How may the life of the child be best preserved? is the third inquiry to be briefly answered.

"In describing the disadvantages of turning by the feet in all cases, Churchill says: '[illegible]tality among the infants thus brought into the [illegible] far as our statistics extend they yield 174 out [illegible]hree.'

"The mortality in shoulder presentations is, doubtless, greater than this. In the first place the position of the fetus weakens its hold upon life. In the second place the hand is more difficult of introduction into the uterus in shoulder than in head presentations, and whatever force is required is sensibly felt by the fetus, and upon that part of the body where pressure is made with the least impunity.

"A timely resort to *Cephalic* version gives to the fetus almost as much certainty of life as if the presentation had been originally of the head. Why not? The maneuver amounts to but little more than in rectification of deviated head positions.

"We are informed by Churchill, that 'Bush gave an account, in 1826, of fifteen cases, in which *fourteen* were born living. In 1827, Ritgen collected forty-five successful cases. Riecke has had sixteen cases.' In all the cases treated by myself from the beginning, the children were born alive. The liability to compression of the cord and consequent death of the fetus, is in proportion to the length of the labor, or rather to the descent of the fetus in the cavity of the pelvis. Hence, to be wholly successful, cephalic version should be performed a short time before, or soon after the commencement of the second stage of labor.

"Can any one mode of treating shoulder presentations be relied on exclusively? The answer must be in the negative. We are disposed to adopt the language of Cazeaux, 'that at the present day it would be improper to embrace either opinion exclusively, for some cases are better suited to the cephalic version, while there are others on the contrary, where the pelvic one is alone practicable; consequently, both operations should be retained in practice, leaving the judgment of the accoucheur to determine the cases, where the one or the other ought to be preferred.' And we will conclude this part of the subject by stating a few of the circumstances under which the different modes of turning may be adopted.

"Turning by the feet is to be preferred in cases of inefficient uterine action, or in exhaustion from long continuance of labor; in hemorrhage, convulsions, or in any case in which there may be a demand for speedy delivery.

"Turning by the head should be selected in all cases where difficulty arises from mal-position merely; or in convulsions, hemorrhage, or prolapsus of the funis, if the uterus should be engaged in vigorous expulsive efforts. In rupture of the uterus our great reliance is in artificial delivery; and the question naturally suggested would be, which will guarantee the greatest safety, podalic version, or cephalic version aided by the forceps? And we would be guided in our action by the answer we gave to the question.

o o o o o o o o

"THE HAND TO BE USED. The relations of the fetus to the pelvis having been ascertained, and the patient placed in a proper position for the version, the next question is, which hand shall be introduced into the vagina? We answer, the hand, the palm of which is directed naturally toward the breech of the fetus. It will be seen at once, that if the fetus is to be moved in the direction of the breech, and in correspondence with the right side of the mother, and the left side of the operator, the right hand could be used with most success. In cases in which the head occupies the right iliac fossa, a choice could be given to the left hand.

"THE PROLAPSED ARM. It is generally conceded, that in turning by the feet, it is not necessary, nor would it be advantageous, to return above the brim of the pelvis, the arm which may have fallen, or been brought into the vagina. In turning by the head, on the contrary, its re-position admits of no doubt; it is imperatively demanded. It is not demanded in consequence of any difficulty in moving the shoulder by its presence, but in the adjustment of the head at the superior strait, and its subsequent descent through the pelvis. By bending the fore-arm of the fetus until the hand is directed to the upper portion of the vagina, and then pushing up the arm, the entire member will soon ascend above the brim of the pelvis, and be no longer an obstacle to complete version.

"The uterus undergoing gradual distension by the growth of the fetus, and by increase in the quantity of liquor amnii, is not from this cause alone excited to an expulsion of its contents. Let a strong and sudden mechanical force be applied to the fibers of the uterus, even to a limited extent, and contraction will speedily follow. If any portion of the fetus should be pushed forcibly against the fundus of the uterus, by attempts to rectify a mal-presentation, a more than corresponding resistance would soon apprise us of a want of adroitness, and the probabilities of failure. The hand of the manipulator in the vagina, imparts a sense of fullness, and induces expulsive efforts on the part of the mother. Pressure on the internal face of the perineum, or along the recto-vaginal septum, urges the uterus to renewed or more energetic action. Simple contact of the uterine and fetal surfaces in turning, does not produce undue contraction of the uterine walls. The presence of the hand, added to that of the fetus, within the uterus, is a common cause of irritation and expulsive force. But the fact, which we most desire to enforce here, is, that when the fetus, in the operation of turning, is moved in straight lines, and sensibly displaces the uterine fibers with which it comes in contact, it is speedily forced back to its original mal-position; nor can its displacement be easily rectified, except it be moved in conformity to the curvatures of the cavity in which it is contained. ◦ ◦ ◦ ◦ ◦ ◦ ◦ ◦ ◦ ◦

"THE MANNER OF PERFORMING CEPHALIC VERSION. Suppose the patient to have been placed upon her back, across the bed, and with her hips near its edge—the presentation to be the right shoulder, with the head in the left iliac fossa—the right hand to have been introduced into the vagina, and the arm, if prolapsed, having been placed, as near as may be, in its original position, across the breast. We now apply our fingers upon the top of the shoulder, and our thumb in the opposite axilla, or on such part as will give us command of the chest, and enable us to apply a degree of lateral force. Our left hand is also applied to the abdomen of the patient, over the breech of the fetus. Lateral pressure is made upon the shoulders in such a way as to give to the body of the fetus a curvilinear movement. At the same time, the left hand, applied as above, makes pressure so as to dislodge the breech, as it were, and move it toward the center of the uterine cavity. The body is thus made to assume its original bent position, the points of contact with the uterus are loosened, and perhaps diminished, and the force of adhesion is in a good degree overcome. Without any direct action upon the head it gradually approaches the superior strait, falls into the opening, and will, in all probability, adjust itself as a favorable vertex presentation. If not, the head may be acted upon as in deviated positions of the vertex, or it may be grasped, brought into the strait, and placed in correspondence with one of the oblique diameters.

"It will be observed, that we do not act upon the shoulders by raising them. Perhaps a slight elevation would facilitate the movement already described—or it might be better to depress them—and, again, by lateral pressure, without either elevation or depression, our object might be accomplished. *Pushing up the shoulders*, therefore, does not constitute a prominent part of turning, if by pushing up is meant the mere raising of the shoulders above the brim of the pelvis.

"As the body of the fetus makes its curved movement under the hand of the operator, it advances upward, as well as laterally, by a combined, rather than a single action, which would give it only one direction.

"The back of the hand, with which we have been acting upon the shoulder, is toward the head of the fetus—consequently, its hold upon the head would be apparently slight—yet, after the shoulders have reached the iliac fossa, the vertex may fall upon the palm of the hand in occupying the strait, and its adjustment, become easy. If, however, there should seem to be a necessity for grasping the occiput, there could be no reasonable objection to a speedy change of hands.

"The entire process of cephalic version is to be adopted in the absence of uterine contraction; or, rather, during the intervals of expulsive force. And, as it is now a vertex presentation, we must be governed, as to the time and manner of delivery, by those general rules applicable to such cases.

"In all our cases, except the one which terminated as a face presentation, the occiput assumed a position corresponding with the first or second position of the vertex. In this case the occiput was before one of the sacro-iliac symphyses, and to this fact we have attributed the tendency of the occiput to slide above the brim of the pelvis, and the difficulty in keeping it in place. If there had been the usual degree of uterine contraction, however, the head would, in all probability, have become fixed, and the presentation would have continued as one of the vertex, instead of changing for the face.

"It will be seen that we lay no claim to the introduction of cephalic version as a mode of treating wrong presentations, and expediting delivery. A very brief examination of the subject, however, may induce some to award to us originality in respect to the means by which a successful change of presentation may be accomplished.

"That cephalic version, by external manipulation—by acting upon the fetus through the parietes of the abdomen and uterus—should have few advocates, is not surprising. To be successful, it confessedly requires a combination of favorable circumstances not often presented. The tissues both of the abdomen and uterus, must be thin and yielding—the liquor amnii must have been retained, and in considerable quantity—and the fetus must be proportionably small.

"In all the obstetrical works we have examined, in which cephalic version is recommended by internal maneuver, it is directed to *raise* the shoulder as the first necessary impression upon the fetus. Viewed anatomically or mechanically, men have not been persuaded into the belief, that raising the shoulder can facilitate the permanent descent of the head into the superior strait. They claim, what is apparent to the eye in viewing a proper engraving, and as it can be demonstrated with the manikin, that the elevation of the shoulder at the brim of the pelvis, tends to increase the long diameter of the fetus, and the transverse diameter of the uterus, and without any favorable adjustment of the head after pressure upon the shoulder has been withdrawn.

"Suppose we follow out the directions given by some, and after the elevation of the shoulder, attempt to force the body of the fetus in a lateral direction, will not the breech infringe against the walls of the uterus transversely? To enable the head to engage in the superior strait, the body must be entirely removed from it, and this can only be done by raising the breech toward the fundus of the uterus. Raising the shoulder, therefore, is very naturally considered a means to prevent cephalic version. And we are not surprised that podalic version is almost universally adopted in the treatment of shoulder presentations.

"If our mode of performing cephalic version is sufficiently clear, in the description already given, it will readily be distinguished from others. We claim for it great importance, on the ground that it is easily executed—that the mother and fetus receive no injury—that there is little or no danger of subsequent displacement after the vertex has been fully adjusted—that, although it is most successful in recent cases, delivery may be accomplished after the membranes have been long ruptured—that it may be executed, after ineffectual efforts to bring down the feet."

I commend these views of Dr. Wright, together with his mode of performing cephalic version, to the special attention of the profession.

CHAPTER XXXIV.

ON PRETERNATURAL LABOR.—TRANSVERSE PRESENTATIONS—PROLAPSUS OF THE UMBILICAL CORD—PLURALITY OF CHILDREN—MONSTERS.

THE transverse presentations which follow, are rarely met with, and some obstetricians have expressed doubts as to the possibility of their occurrence. However, as they are treated of by several writers, I have deemed it proper to make a brief reference to them.

Should the *Side* of the child present, it may be distinguished from the head by its want of firmness and roundness, as well as by the absence of sutures and fontanelles; from the breech, by the want of the furrow between the two rotund nates, with no coccyx, anus, or genital organs. The principal discriminating signs of a side presentation are the presence of two or three ribs, with the intercostal spaces; and should any doubt exist, the hand should be passed into the vagina sufficiently to allow two fingers to be carried fully up to the superior strait. A single intercostal space may be mistaken for the sagittal suture.

If the child's *Back* presents, three or four of the spines of the vertebræ can be detected, and also the origins of the ribs; and these may be felt even previous to the full dilatation of the os uteri.

A *Sternum* presentation may be known by the introduction of two fingers, which will distinguish the sternal bones, the continuance of the bony plane, the cartilages of the ribs at their origin from the sternum, and the intercostal spaces.

When the *Abdomen* presents, there will be felt no osseous prominence, but only the large, soft abdomen, and, perhaps, the ensiform cartilage may be distinguished, as well as the insertion of the umbilical cord; though the practitioner must recollect that the cord itself may present when the abdomen does not, as in prolapsus of the cord.

It is recommended in all these transverse positions to effect the delivery by turning, the practitioner being governed in the operation by the rules given under the management of shoulder presentations.

A PROLAPSUS OF THE CORD, is where the umbilical cord presents along with the head, nates, or extremities of the child, and may be considered under the head of preternatural labor. It is not frequently met with, having occurred, according to statistics, 437 times in 105,146 cases, or about 1 in 240. Of itself, the falling of the cord has no influence upon the advance of the labor, its smallness of size and compressibility offering but little or no hinderance to the passage of any part of the child through the pelvic canal. The danger is to the child, which, from pressure upon the umbilical vessels, may die by asphyxia. Until the fetus is expelled into the world, its life depends upon, and is sustained by, a free circulation through the arteries and vein of the cord, and any suspension of this circulation, by compression or otherwise, will necessarily occasion death, by interrupting the communication between the child and its mother. We may form some idea of the peril to which the child is exposed from the statistics of various authors, in which 245 children were lost out of 392 cases of prolapse, being considerably more than one-half.

Various circumstances have been referred to as favoring, or causing a descent of the cord; as mal-positions of the child; uncommon length of the cord; uterine obliquity; and malformation of the pelvis. A small child, with an excessive amount of liquor amnii, may contribute to the descent of a loop of the cord, by allowing the fetal head to move away from the pelvic brim. When there is a copiousness of the amniotic fluid, the sudden rupture of the membranes being followed by a forcible gush of this fluid, may carry with it a loop of the cord; and this would be more likely to occur should the patient be standing, or in some other unfavorable attitude when the rupture happens. Prolapse of the cord may also arise from a want of energetic contractions of the uterus, in which the fetal head is not maintained with sufficient power at the superior strait. The attachment of the placenta near the os uteri, by which the cord is held just at the orifice of the uterus, likewise favors a prolapsus. Cases have occurred which were not due to any of the above-named causes, and which could not be satisfactorily accounted for. Considering the length of the cord, and the facility with which it moves about in the liquor amnii, it is somewhat surprising that prolapsions of it are not more frequently met with.

DIAGNOSIS.—Prior to the rupture of the membranes, it is very difficult, if not entirely impossible, to detect the cord; it is only after the rupture that we can determine its prolapse with any degree of certainty. The cord then hangs down in the vagina, is of more or less length, sometimes passing down beyond the vulva; its roundness, smoothness, and softness may enable the practitioner to distinguish it when in the vagina, and especially its pulsations, if the circulation has not been suspended; when it appears externally, it can be readily recognized.

TREATMENT.—In the management of cases of this character, various modes of treatment have been advised, but none of them have been generally successful. If the cord be cold and flaccid, with no pulsations, the child will undoubtedly be dead, and as assistance is required only for the safety of the child, the labor should be allowed to progress without any interference, unless called for by other circumstances. We must, however, be cautious in pronouncing the child's death, for the pulsations may cease during the contractions of the uterus, and return again as soon as these have subsided; beside, instances have occurred where the pulsations have not been recognized for ten or fifteen minutes, and yet the child has lived.

The several means recommended by authors, in cases where the child is known to be alive, are as follows:

1. Returning the prolapsed cord above the superior strait and the presenting part of the child, and retaining it there until this has so far descended that any further prolapse will be prevented. If this could always be accomplished, it would be a very certain and desirable method; but, usually, the difficulty is not detected until after the membranes have ruptured, and the head together with the cord have been forced down into the brim; and then any such attempts would not only prove unsuccessful, but, if persisted in, might still further increase the difficulty by displacing the head. Not unfrequently the os uteri may be incompletely dilated, and then any attempts to return the cord would be impracticable. When it is fully dilated, the attempt to elevate the

presenting part, or to carry the fingers with the cord between the os uteri and the presenting part might occasion a return of the pains, and thus prevent the re-position from being accomplished. Various instruments have been presented to the profession for the purpose of returning the cord; but I have less confidence in their utility, at least so far as I have become acquainted with them, than with the manual method, by which a few cases have been saved. When the waters have been freely discharged, and the uterus acts with energy, any attempts to return the cord will almost always be unsuccessful.

If the cord can, however, be carried above the presenting part, by the introduction of the hand in the vagina, and two fingers into the uterine cavity, I would advise placing it in the axilla, if possible, or above the knees; and if these cannot be effected, to carry it carefully from one side to the other. However, it too frequently happens, that after the cord has been raised above the presenting part, it immediately prolapses again on the removal of the fingers. This has sometimes been prevented by introducing a piece of soft sponge, carrying it upward with the cord.

2. If the head has not entered the pelvic cavity, but is still at the brim, a resort to turning has been advised, provided the os uteri be fully dilated and not rigid; but as this operation is always attended with danger to the mother, we should not too hastily nor too rashly decide upon it. If the soft parts be well dilated, the pelvis capacious, and the female has given birth to one or more children previously, the child may possibly be saved by the operation; but the accoucheur should always remember that no interference, of whatever nature, is justifiable, which has for its object the safety of the child at the risk of injury or death to the mother. Where turning has been performed, about seven out of ten children have lived: the consequences to the mother are not given. Merriman advises turning only in instances where the child is living, as known by the pulsations of the cord, the head not having entered the pelvis, the parts relaxed and os uteri well dilated, and the pains weak and inefficient; and even then it should not be attempted, unless the practitioner has had some experience in the operation. Dr. Collins says: "As to turning, the risk to the mother is, in the majority of cases, so great as to forbid its employment, nor do I think the practitioner justified by the circumstances in so greatly hazarding his patient's life."

3. If the head has escaped into the vagina, and the pulsations of the cord are felt, and especially when they are diminishing or becoming feeble, the delivery may be hastened and the child's life saved by a resort to the forceps, and this may be accomplished with but very little risk to the mother. The forceps must be carefully applied, so as not to

fix the cord between either of its blades and the head, and the extraction must be as rapid as possible, but always consistent with the safety of the mother. Unfortunately, however, we more frequently find the child destroyed by the compression of the cord, before the instrument can be applied.

4. It has been recommended to place the cord in the angle formed by the junction of the sacrum and ilium, where it will be less exposed to compression, and that sacro-iliac symphysis is to be selected, which will not be occupied by the forehead or occiput. This has sometimes proved successful, and will probably answer in cases where the pelvis is large and the head small. In ordinary-sized pelves but little reliance can be placed in this method.

Of these various modes, the selection must be left to the judgment of the accoucheur, who will determine according to the stage of the labor, the condition of the soft parts and os uteri, the conformation of the pelvis, the presenting part of the child, and various other circumstances which may be present. In a premature labor, I should advise no other interference than that named in method No. 4.

The patient's friends should always be informed of the fact, when there is a prolapse of the funis, together with the great probability of the child's being still-born; and should she exhibit any surprise or uneasiness at our uncommon attentions, there is no harm in acquainting her that "the cord has fallen down, adding, however, that it will not interfere with the labor in the least, but may occasion the child's death;" nor would there be any impropriety in explaining to her the uses of the cord, and the reasons why the child may be lost.

It is also proper to have the ordinary means for resuscitating the child in readiness, and which should be used in all instances when delivery has been effected shortly after the cessation of the pulsations of the cord, the slightest action of the heart being a sufficient cause for attempting resuscitation.

Professor Meigs suggests the following measures in prolapse of the funis, which, however, have not yet been tried by himself:—"Take a piece of ribbon or tape, a quarter of an inch wide and four or five inches long. Half an inch from the end, fold the tape back, and sew the edges so as to make a small pocket. Then fold the other end in the opposite direction, and sew that also to make a pocket of it. Now, if the cord be taken in the tape, and held as in a sling, a catheter may be pushed into one of the pockets, and that one thrust into the other, so that we shall have the cord held as in a sling, which is itself supported on the end of the catheter or womb-sound. Let the catheter be now pushed up into the womb, beyond the fetal head: it will carry the secured portion of cord with it, and the catheter being withdrawn, the tape is left in the uterine cavity, where no harm can be occasioned by its presence. If required, several such tapes could be secured round the cord, and all of them fixed on the end of the same catheter, and pushed at the same moment far up within the cavity of the womb." This plan may answer in some cases, but I doubt its general application. Dr. Arneth has succeeded in saving ten out of eleven cases, by carrying up the cord, with the introduction of the whole hand into the uterine cavity.

In a previous part of this work, (page 127), I have made some observations relative to COMPOUND or MULTIPLE PREGNANCY, the signs by which it may be suspected or recognized, and the several circumstances under which it may be present. At this place I shall refer more particularly to the management required for such cases. According to statistics laid down by Churchill, in his work on Obstetrics, in 167,676 cases occurring in British practice, 2,572 were twins, or about 1 in 65⅕; and 37 were triplets, or 1 in 4,531⅓. In 36,570 cases in French practice, there were 332 twins, or about 1 in 110; and 6 triplets, or 1 in 6,095. In German practice, 251,386 cases gave 2,967 of twins, or about 1 in 84; and 35 of triplets, or about 1 in 7,185. The average occurrence of the whole 455,632 cases, would be 5,871 of twins, or 1 in 77¾; and 78 of triplets, or 1 in 5,840.

In a plurality of children, or where women give birth to two or more, the danger is always greater than in single pregnancies; yet many females are promptly delivered with but little more pain than in cases where but one child is born. The danger in these cases is owing principally to an over-distension of the uterus; to a preternatural presentation of one or both children; to hemorrhage after the expulsion of the placenta, the uterus contracting feebly or not at all; and not unfrequently, inflammation of the veins and deep-seated structures of the uterus occurs, terminating fatally.

The mortality to the children in twin births is, according to statistics, about 1 in 3½; in triplets, 1 in 3. Though it must be recollected that in this calculation the death of the child can not, in every instance, be attributed to the labor. In 184 twin cases recorded, 43 were still-born; and in 240, premature labor occurred 54 times, with 12 cases of a putrid fetus. The fatality appears to be greater among male children, and especially when they are twin cases of opposite sexes. These statistics are based upon the records of various accoucheurs, and may be found in detail in Churchill's Midwifery.

DIAGNOSIS.—The difficulty in diagnosing twins during pregnancy has already been spoken of; but at the time of labor, after the expulsion of the first child, the presence of a second can be positively determined, and it is the duty of the practitioner to institute a proper examination, that he may have no doubts upon the subject. A plurality of children may be suspected, from the uncommon size and shape of the abdomen, though it is frequently the case that in this respect the female is not larger than those who carry but one child; from the feeble and irregular action of the uterus, even after the labor has continued for several hours; and from the slowness with which the bag of waters is formed. After the delivery of the first child, its small size may likewise occasion us to suspect that there is another. Yet these various circumstances may be present, and the case be one of single pregnancy.

It is, therefore, required of the accoucheur, in every case of labor which he may attend, immediately after the birth of the first child, to place his hand on the abdomen of the mother, for the purpose of ascertaining whether there be a second child: if there be another, he will find the uterus still hard, large, and unequal; the fundus remaining at the epigastrium, or considerably above the umbilicus, and occupying nearly as much space as previous to the birth of the first. He should not, however, stop at this external exploration; it is absolutely necessary that he positively ascertains not only the presence of another child, but likewise its presentation and position; and to effect this will require an internal examination. Holding the cord of the first child tense with one hand, but without making any traction upon the placenta, he will pass one or two fingers of the other hand along the cord, and if another child be present, the fingers will come in contact with the second bag of membranes, when he should correctly ascertain the nature of the presentation, after which it will always be proper for him to inform the husband or nurse of the fact; but it should not be immediately made known to his patient, lest such a depressing influence on her mind be caused, as to materially retard the delivery of the second child. No particular secrecy is necessary, but the time of giving the information to the patient, should depend much upon her mental and physical condition, and the circumstances connected with her case. It may be proper to observe here, that practitioners have been deceived in both their external and internal examinations, having mistaken a large placenta, a large quantity of coagula, an accumulation of blood behind the membranes of the retained placenta, etc., for the sac of another child: on rupturing these, the escape of blood or coagula, instead of the amniotic fluid, will at once solve the case.

TREATMENT.—Usually, there are no suspicions of a twin labor until after the birth of the first child, and the delivery may proceed as favorably as in single cases. But it frequently happens that the force and frequency of the pains become greatly diminished, in consequence of the uncommon distension of the uterus; or the contractions being energetic, the delivery progresses slowly, because the contracted uterus can not act directly upon the whole of the body of the child which first reaches the superior strait. And in cases of premature labor occasioned by twin pregnancy, the delivery may be delayed, from the immatured condition of the cervix uteri, which has not undergone those changes which facilitate its dilatation at full term.

When the practitioner suspects twin labor in a case where the delivery is proceeding very slowly, and more especially when his suspicions are strengthened by hearing sounds of the fetal heart at two distinct locations, he must be very cautious how he ventures to administer Ergot, or other agents to increase the action of the uterus, prior to the birth of the first child: no interference of this kind is required, or at all necessary. The labor should be allowed to proceed, no matter how slowly, until the first child is born. But should any accidents or circumstances offer requiring aid, they should be treated in the same manner as recommended when they occur in single labors; being careful, however, should a resort to turning be deemed advisable, as in a shoulder presentation, to obtain a hold of the feet of the right child before making the evolution. If the children are contained in one sac, or if there are two sacs and both have become ruptured, a difficulty in relation to this matter will be very apt to occur. By passing the hand along the external part of the limbs, until it reaches the breech or genital organs, we may avoid the mistake of bringing down a limb of each child.

As I have already, when treating on the Management of Labor, page 260, recommended two ligatures to the umbilical cord, previous to separating it, it is unnecessary to enter into any especial remarks upon the subject at this place. After the birth of the first child, if the presentation of the second is proper, and the contractions of the uterus continue, no interference is necessary; indeed, it not unfrequently happens that the pains are so energetic, and the expulsion so rapid, that the second child is born before the first can be separated from its cord. But in cases where there are no pains after the birth of the first child, or when they are present are but feeble and inefficient, means should be used to forward them, after having waited some fifteen or twenty minutes. A bandage should be firmly applied around the abdomen, frictions and compression should be made over it upon the uterus, as

Caulophyllin, Cimicifugin, or stimulants, if necessary, should likewise be exhibited internally. As the passages are already dilated, the exhibition of Ergot is not objectionable. Should the second child present naturally, that is, either the head or breech presenting at the brim, and half an hour or an hour has passed since the birth of the first, the application of the bandage, together with the artificial rupture of the membranes, will generally occasion a renewal of the contractions, and delivery will be terminated without any further interference.

In ordinary cases, where the pains do not return, notwithstanding the means employed, I would not advise the accoucheur to wait beyond an hour; because the parts being yet soft, dilatable, and amplified from the expulsion of the first child, the second may be expelled with more facility, and with less suffering to the mother, than would be the case if a longer delay was permitted. The hour having therefore expired, and no return of uterine action, the presentation of the second child being known, the parts being soft and yielding, and the os uteri dilatable, the membranes should be ruptured, and, if necessary, the hand passed upward to reach the feet, and the evolution proceeded with according to the rules already given, being very careful not to empty the uterus of its fetus before contractions come on. Too sudden an evacuation of the uterus may give rise to hemorrhage, inversion, or other accidents.

Turning, however, must never be attempted when the resources of nature are adequate to the expulsion of the child.

After the delivery of the first child, the parts of the female being soft and yielding, and also sufficiently amplified by its expulsion, a foot or breech delivery of the second child, either natural or effected artificially, is by no means so difficult or so painful to the mother, as in similar labors with but one child; nor, as a general thing, is the safety of the child so greatly compromised. In a shoulder presentation of the last child, cephalic version, according to Dr. Wright's method, page 409, might probably be performed with success.

Sometimes, the female becoming very much fatigued and worn out by the tediousness of a twin labor, may require artificial aid, as for instance, with the forceps, for the delivery of the first child; and in such cases, it will generally be found advantageous as well as necessary to expedite the delivery of the second by bestowing similar assistance. Interference will always be demand [illegible] the expulsion of the second child, when it present [illegible] n it is complicated with convulsions, hemorrh [illegible] And these complications must be combated according to the rules advised for them, when occurring in single labors.

Hemorrhage is always to be dreaded in twin births, and must be most carefully watched; it may almost always be ascertained at an early period, even before the practitioner would be led to suspect it from the character of the discharge externally, by closely observing the expression and color of the patient's face. When hemorrhage occurs before the birth of the second child, it will demand prompt action; the labor must be hastened by turning, if the presenting part is above the superior strait — by the forceps, when the head is in the pelvic cavity. Hemorrhage after the birth of the second child, must be treated as hereafter recommended.

Occasionally, there will be a simultaneous presentation of parts of the two children, as, the two heads, the feet or arms of each, or the head of one with the extremities of the other, etc. In these cases, it will be necessary to push up one of the presenting parts, in order that the remaining one may advance; and should these double presentations prevent the labor from progressing safely, a resort to instrumental aid may be demanded, as decapitation of one child, or such other measures as the exigency of the case may require.

The practitioner must recollect that in twin labors, one placenta may be common to both children, or, there may be a placenta to each child, but connected with each other marginally; and, an improper management of either of these conditions may occasion dangerous hemorrhage. No attempts at removing the placenta of the first child should be made previous to the delivery of the second, as uncontrollable hemorrhage might thereby be excited. And, after the expulsion of the second child, a much longer interval than in ordinary cases must be allowed for the delivery of the placentæ, (unless the presence of hemorrhage renders its prompt removal necessary,) as the uterus being somewhat enfeebled or exhausted, does not so readily renew its contractions as in single labors. The removal of the placentæ must never be effected by forcible traction upon the cord, but by arousing and securing permanent uterine contractions, using frictions and compressions externally, and making slight tractions upon the cord, as heretofore recommended in single labors.

In hemorrhages, after the birth of the last child, the hand will require to be introduced within the uterine cavity, in order to detach and remove the placentæ; and it should not be withdrawn, until a perfect separation of both has been accomplished — and even then, not until uterine action has been aroused sufficiently to induce due and permanent contractions of the organ. After the placentæ have been removed, its uterine surface should invariably be examined, to ascertain whether any part has been left behind within the uterus.

In cases where a premature labor has been induced by the presence of twins within the uterine cavity, and the first child has been expelled, the recommendation to rupture the membranes, or in any way hasten the delivery of the second, is exceedingly unwise and improper; this recommendation is only applicable at full term. After the escape of the first child, should the uterus cease any further action, the second remaining one may be matured by a further continuance of the pregnancy, and this result should always be favored by non-interference, unless accidents occur threatening the mother's life, and rendering it imperative to empty the uterus of its contents.

After the expulsion of the placentæ, the bandage should be firmly applied around the abdomen, with a compress over the uterine tumor, to secure its permanent contraction, and prevent any tendency to hemorrhage; and as the shock to the nervous system is usually much more severe than in natural labors, the patient must be kept quiet, the presence of company rigidly prohibited, and stimulants, antispasmodics, or anodynes, administered according to the indications. Uterine hemorrhage should always be closely watched for, and every means be employed to guard against it.

Where three or more children are present, they will require to be managed in accordance with the above rules, recollecting that the labor will generally proceed slowly, but that the dilatation of the soft parts will not be so extensive, nor the sufferings to the mother so great as in labors of one or two children, from the fact that triplets and quadruplets are usually very small. Hemorrhage, however, is always to be suspected.

In plural births, every variety of presentation may occur; thus, the head of the first child, and the breech of the second, which are favorable positions; the head of each may present; the breech or shoulder of one, and the head of the other; each child may present by a shoulder; together with other varieties, rendering it highly necessary for the accoucheur to be conversant with the modes of diagnosticating each and all of them. Cazeaux observes: "[illegible] states that, on one occasion, he found the orifice plugged [illegible] t had become engaged, and which at first sight [illegible] tity of hands and feet. A more careful [illegible] inguish four inferior extremities, which were delivered as far as the hand, and one arm.

"'At first,' he says, 'I was in great perplexity, because I could find no way of introducing my hand into the womb, for the purpose of distinguishing and seizing the two feet belonging to each child, and because all my efforts to make even one of these extremities go back again, proved abortive; beside which, in drawing on any two of them, I might confound and bring down the feet of two different fetuses at the same time; and lastly, even if I succeeded in seizing the two feet belonging to the same infant, I might, by drawing on them, engage the other parts, and thus augment the difficulties. Being greatly embarrassed as to the proper course, and yet obliged to act, the employment of a measure recommended by Hippocrates, under different circumstances, happily suggested itself; that was, to suspend the patient by her feet, hoping that the heads and the trunks of the children would, by their weight, draw one or more of the extremities toward the fundus of the womb, which was still distended by the waters. The husband and brother-in-law of the woman passed their arms under her hams, and thus held her suspended, so that only the head and shoulders rested on the bolster. I intended, as soon as I mounted on the bed, to press back one or more of the free extremities into the womb, but two had already returned from the mere position of the mother, and the other three soon followed by the aid of my fingers. Immediately afterward, I was enabled to introduce my hand into the uterus, and to withdraw successively therefrom three children by the feet.' In bringing forward this case, I only desire to illustrate what has been said concerning the difficulty of diagnosis. I ought also to allude to the impossibility of the reduction, and the singular procedure resorted to, with a success that seems to warrant its employment again under similar circumstances."

Ramsbotham detected, by the direction of the toes, that two feet presenting at the vulva, a right and left, belonged to different bodies; he terminated the labor by making careful traction at one leg, and gently pushing up the other, extricating each breech from the pelvic brim, and the children were born living. Such cases, as before observed, occur when the children are in one sac, or when the sac of each ruptures before the first child is expelled.

The most difficult complication of presentation is where, as the first child descends, with the pelvic extremity first, its chin becomes locked under the chin of the other, which was presenting the head, and which had passed into the pelvic cavity. In this case only one child can be saved; the child which has descended must be eviscerated and detruncated, leaving its head in the uterine cavity; this must be pushed up above the superior strait, the second child brought down and delivered, and finally the head of the first must be removed.

The fetus is subject to various diseases, and to excessive development, or perversion of parts, while within the uterus, which may form MONSTERS or MONSTROSITIES, and which frequently exert an unfavorable influence upon the parturition. The difficulty in these cases depends altogether upon the relative proportion between the fetus and the pelvis; if the child be small, there will be no delay or trouble in its passage through the pelvis; if it be large, from excessive development, or from a union of two fetuses in one, the labor will be difficult and preternatural according to the disproportion existing and other circumstances which may offer.

Hydrocephalus, ascites, and distension of the abdomen with wind, or water, are the most common diseases incident to the fetus which render labor difficult; these have been already treated upon. (*See page* 331.)

Monsters are occasionally met with in practice, and mainly belong to one of the following classes, viz: 1. Monstrosity from deficiency of certain parts of the body, as, in anopses, where the eye and orbit are wanting; cyclopes, where there is but one eye, situated in the center of the forehead; acephalous, where the head is absent; anencephalous, where the head is present, but is devoid of brain, etc. 2. Double monstrosity, where two or more children become united together, as in cephalodymia, where the heads grow together; hepatodymia, where the livers are united; pelvidymia, where the pelvic extremities become fused, etc. 3. Monstrosity, or ectopy, in which one or several parts are abnormally situated. 4. Where clefts or fissures occur in parts which are united when in a normal condition. 5. Where there is an excess or disproportionate enlargement of certain parts. 6. Atresia, or where parts which are normally opened become closed. 7. Hermaphroditism, or vicious conformation of the genital organs. Various causes have been assigned for these monstrosities, among which the most probable are: 1. A primitive defect in the germs; 2, accidental changes under- [illegible] fetus at some period of its intra-uterine life, effected by [illegible] of the mother, injuries, an unhealthy condition of it [illegible]

In an obstetrical point, the only [illegible] from their sometimes creating a very painful [illegible] hose belonging to the above 2d, 3d, and 5th [illegible] pecially; and when they do occur, it [illegible] ar to form a correct diagnosis. But even should he be able to detect a monstrosity, it does not follow that he should interfere, for the natural efforts are frequently adequate to the task of terminating labor, and even without loss of the child's life, as for instance, in the cases of the Siamese twins, and Rita Christina.

Double monstrosity, or the adherence of two fetuses may be suspected only by evidence of a negative character. "If two bags of water are detected by the finger, if it is necessary to rupture the membranes twice, if the amniotic waters are discharged at two separate and distinct periods, the presence of independent twins in the womb may be regarded as certain; for there are never two envelopes for a double monster, and two perfect twins are very seldom shut up in the same amniotic pouch. Again, if two feet or even a single one descend with the head, more particularly if the feet yield to the tractions made on them, and appear at the vulva without the heads having a tendency to reascend, we may affirm there are two infants, because a monster is never composed of two individuals held together in such a way that the head of one is alongside the feet of the other; but if several limbs present simultaneously, we can only ascertain whether the children to which they respectively belong are joined together or are independent, by carrying the hand up into the womb." (*Cazeaux.*)

TREATMENT.—The management of monstrosities is similar to that heretofore named, in cases of difficult labor. A fair trial should always be accorded to the efforts of nature; if after having waited a sufficient length of time, say for twenty-four hours, during which time the pains have been strong and active, if delivery is not effected, means should then be adopted to expedite it. Or, should symptoms of exhaustion manifest themselves previous to this time, or hemorrhage, or other accidents, the accoucheur should at once interfere. No specific rule can however be given; the general principles of obstetrics must be the guide; the success attending the case will depend altogether upon the skill and judgment of the attendant, who will resort to the forceps, perforator, crotchet, etc., according to the peculiar circumstances of the case; and who should not hesitate to destroy or mutilate the child, if it become necessary, in order to insure the safety of the mother. In case of great pelvic deformity, the Cesarean operation may become necessary, but, with a normal pelvis, the deformity of the child must be very excessive, which should lead the practitioner to adopt this expedient for its removal.

When monsters live, and are capable of action as individuals, they have the same rights as other persons; and the destruction of a monster after birth, however great the deformity, is a criminal act, punishable as infanticide. This should not be forgotten, as I have heard of midwives who did not hesitate to destroy monsters as soon as born.

CHAPTER XXXV.

COMPLICATED LABOR—UTERINE HEMORRHAGE FROM PLACENTA PRÆVIA—PUERPERAL HEMORRHAGE—PLACENTAL PRESENTATION.

One of the most common complications of labor, and at the same time the most alarming, is HEMORRHAGE or FLOODING. It attacks suddenly, progresses rapidly, and requires prompt and energetic treatment; equanimity, self-possession, caution, and a thorough familiarity with the appropriate remedial measures, are necessary requirements for success—without these the individual who attempts the practice of obstetrics is extremely culpable. No one can tell with certainty, in an early stage, whether hemorrhage will occur during any given labor; and it is not unfrequently the case, that it attacks suddenly and fatally in instances where least expected; no one can know at what moment he may be called to treat a formidable puerperal flooding—hence, the importance of holding the above requirements. A proper attention, may insure safety to two human beings, while an ignorant or ill-directed course, is almost certain to terminate fatally.

I have already referred to abortion and the hemorrhage which may be present in the early months of gestation (page 166); this may be, and is at times, very profuse, often resulting in the death of the patient. But the more fearful and perilous attacks of flooding are those which take place at the parturient period. These may be divided into four forms: 1st. That which occurs at an early period of labor from placental presentation. 2d. That which occurs during labor, previous to the birth of the child, but not dependent upon placenta prævia. 3d. That which occurs after the birth of the child, but previous to the expulsion of the placenta. 4th. That which takes place after the delivery of the placenta.

In 75,596 cases of labor, hemorrhage occurred 517 times, or about 1 in 146½; out of 630 cases of hemorrhage, 111 mothers were lost, or about 1 in 5½; out of 443 cases, 109 children were lost, or about 1 in 4. In accidental hemorrhage, 28 cases proved fatal out of
nearly 1 in 4; in unavoidable hemorrhage 51 cases
182, or about 1 in 3½; and in hemorrhage after deli
out of 293 cases, or about 1 in 12. (*Churchill.*)

The placenta may vary in its point of attachment
of the uterus; thus, in one class of cases it

of the fundus, in another to a part of the body, and in others to the cervical portion, and hemorrhage to any great extent will not take place in either of these conditions, during gestation or parturition, unless the placenta be considerably separated from the uterine surface. A slight detachment may occasion a discharge of blood from some small bloodvessels which have become thereby exposed, but insufficient to create alarm, or amount to a flooding. It is only when the separation has, from any cause, become so extensive as to expose the patulous orifices of the large veins and arteries of the uterus, through which the utero-placental circulation has been carried on, that a quantity of blood escapes giving rise to puerperal uterine hemorrhage. And so long as these orifices remain open, whether from inertia of the uterus, or from the presence of a body within its cavity which prevents its perfect contraction and condensation, so long will the hemorrhage continue. It is only by the contraction of the muscular fibers of the uterus, that these orifices as well as the caliber of the whole tract of the bleeding uterine vessels, become diminished to such an extent as to permanently arrest the flooding. And to adopt means for the purpose of effecting such uterine contraction is the duty of every accoucheur who treats puerperal hemorrhage.

HEMORRHAGE FROM PLACENTAL PRESENTATION, or PLACENTA PRÆVIA, is termed *unavoidable hemorrhage;* it is the most dangerous form, and the most difficult to manage. The placenta being attached over the cervix uteri, as the fibers of the cervical portion of the uterus become more and more developed during the latter months of pregnancy, in order to enlarge the lower portion of the uterine cavity, the connection between the placenta and uterus is gradually separated, and the utero-placental vessels being thereby ruptured or lacerated, a discharge of blood follows, proportionate to the extent of separation and size of the bloodvessels ruptured. And when this occurs during labor, the hemorrhage grows more excessive with the advance of the labor, as each uterine contraction effects an increase of separation. The placenta may be inserted immediately over the os uteri, so that the centers of the two are in correspondence, or it may vary in any degree between this central location and the insertion of its edge near the os uteri; the danger in these cases increases as the center of the placenta approaches that of the os uteri. The fact that the placenta may lie over the os uteri, was noticed by several of the older French writers, among whom may be named Guillemeau, Mauriceau, Amand, Astruc, and Dionis, as well as by others who have written since the middle of the eighteenth century. About the year 1728, Daventer called the attention of the profession in Holland to this matter, and some twenty-five years later, Bracken and Pugh brought the subject to the notice of the physicians of England.

Although these writers accurately described the condition of things at the period of labor, they all seem to have entertained the opinion that this malposition of the after-birth was owing to some accident which had dislocated it from its former connection with the fundus of the uterus, and that it had gravitated downward by its own weight, until it had become placed in its new position, covering more or less completely the orifice of the organ.

Such an opinion, however, does not obtain with the well-informed of the profession at the present day, all agreeing, that inasmuch as the chorion, the decidua, and the membranes, as well as the bloodvessels, both of the uterus and placenta, maintain the same relations to each other when the placenta is found in this position, as when in its normal location, that, from some unknown cause it must have been attached *from the first*, in the lower part of the womb, and not have fallen from a former attachment.

As early as in 1730, Giffard published the opinion, that he had "good reasons to believe that the placenta sometimes adheres to, or near, the os internum, and that the opening of *it* occasions a separation of the bloodvessels, and consequently a flooding." A similar opinion was expressed by Heister, in 1739, who said "some moderns consider as a cause of hemorrhage, the adhesion of the placenta to the mouth of the womb; so that the more the os uteri is dilated, the greater is the separation of the placenta, and the more profuse the flooding." In 1761, Leveret, and in 1779, Smellie, expressed similar views, maintaining that the placenta was from the first over the os uteri, and that its being there was *not* the result of a detachment from the fundus, and a dislocation of the organ. This opinion has universally prevailed among scientific men since that time, and now requires no additional proof to that furnished in abundance by practical men, both by reason and by observation. For a thorough and satisfactory explanation of this subject, the profession is indebted to Dr. Rigby, of Norwich, England.

Instances of placental presentation have been met with, in which delivery has been safely accomplished by t[illegible] atural powers without
any hemorrhage whatever, but the[illegible] are never to be
anticipated. Most commonly, [illegible] presentation
is a flow of blood occurring so[illegible] ths of gesta-
tion, from the seventh month [illegible] eriod that

the cervical portion of the uterus begins to rapidly develop itself; a detachment of the placenta ensues as the uterine fibers expand, and a discharge of blood follows, which is the first symptom observed. The hemorrhage may be so sudden and copious, even at this first onset, as to prove nearly, if not quite fatal; more generally, however, its first manifestation is but slight, ceasing if the woman lies down and remains quiet. This early sanguineous flow, when slight and so easily checked, is looked upon by the patient as an accident depending, probably, upon some strain, exertion, etc., and after its cessation is no more thought of. In five or six days, a further detachment of the placenta is occasioned by the continued development of the cervical part of the uterus, and a fresh discharge takes place, which is apt to be greater than before; and from time to time these attacks of bleeding occur, increasing in severity each time, until, if the woman reach her full term, she may be so completely exhausted and prostrated from loss of blood, as to be incapable of sustaining the loss of even a few ounces more. A woman who has not suffered from bleedings previous to term, and of strong constitution, is more likely to recover, uninjured, from a placenta prævia labor, than one the reverse.

The circumstances under which a vaginal examination must be made are, 1st, when the hemorrhage is copious and continued; 2d, when the patient has reached full term, or is within several days of it; and 3d, whenever there are uterine contractions, however slight they may be, or however distant the intervals between them.

DIAGNOSIS.—A placental presentation may be suspected when the first hemorrhage occurs suddenly and without any apparent cause, being renewed every week or two. If the placenta is inserted over the anterior lip of the os uteri, it will prevent ballottement. At the period of labor it may be suspected by the increased flooding during a pain, but which diminishes in the intervals. When it becomes necessary to make an examination per vaginam, we may then positively ascertain the nature of the case. I have just stated that an examination of this kind must be made when hemorrhage is copious and continued, and this observation applies to all hemorrhages taking place from the uterus during the latter months of pregnancy. In these cases we are not to wait for pains, nor be governed by them; for the probabilities are that the uterus has become so enfeebled or paralyzed from the large quantity of blood discharged that no pains will be felt — the organ is too weak to contract. Indeed, the absence or trifling character of pains during these hemorrhages is a most positive indication of the necessity for interference to learn the cause of the flooding, and to check it if possible.

In making the vaginal examination it is immaterial as to the position assumed by the patient, provided the fingers can be introduced. The first two fingers may be passed within the vagina, or, if the os uteri be high up in the pelvis, it may become necessary to introduce the whole hand. The examination should be conducted with great care, for a quantity of coagula, will generally be found in the vagina, the separation or detachment of which will cause a return of the hemorrhage, or increase it in quantity. Neither should the finger be forced within the os uteri; if this be not sufficiently dilated to permit the entrance of the finger without difficulty, it would be better to wait until the flooding has caused sufficient dilatation or dilatability.

The placenta will be recognized by the soft, fleshy, fibrous, lobular sensation which it imparts to the finger, differing from a coagulum by being attached to the inner surface of the cervix uteri, and by not being readily perforated or broken down—a coagulum is loose, can be removed, and may be pierced by the finger and destroyed without any difficulty As the examination will produce a discharge of blood, the practitioner must make it a positive one; he must not allow himself to mistake a clot, nor the cervix, for the placenta. The latter will have a thick, spongy feeling; the former is movable and readily broken down, which is not the case with the placenta. Sometimes the detached uterine surface of the placenta will be covered by a thick, smooth layer of coagulated blood, which will prevent the finger from coming into direct contact with the placenta; but any error in diagnosis from this circumstance may always be avoided by carefully breaking down or detaching the coagulum. Whoever will carefully pass the point of his finger over the uterine surface of a recently expelled placenta, whenever the opportunity offers, will never confound a coagulum of blood, however firm, with a placenta inserted at the cervix.

Having ascertained the presence of the placenta, the next inquiry will be, whether the presentation be complete or partial? If it be complete, no membranes can be felt; if partial, the edge of the placenta may be readily detected, together with the membranes passing off from it;—a portion of it may be felt closing a part of the os uteri, and through the membranes may, probably, be recognized the presenting part of the child. The finger may also be carefully carried around to ascertain where the placenta is free or detached, in a complete presentation, but no ef
should be made to separate it, or to pass the finger between its
inner surface of the cervix. Cazeaux gives the following rule
termining placenta prævia in certain cases:—"When the h
takes place either in a woman with her first child, or at the

of the gestation, when, in a word, the cervix uteri is not sufficiently dilated to permit the introduction of a finger, we might still be enabled to determine the cause of the flooding by the following signs, namely:—

"1. A hemorrhage caused by the placenta's insertion over the internal orifice never occurs before the end of the sixth month; and, very frequently, not until the last four or six weeks of gestation. Beside, it is highly probable that the period at which the flooding comes on, is usually subordinate to the greater or less extent of the placenta corresponding to the neck; that, in cases of insertion, center for center, it is manifested much sooner than where only one of its margins is in opposition with the orifice. Nevertheless, there are numerous exceptions to this (as M. Nægèle considers it) nearly general rule; for, in a large number of the cases of central insertion, the hemorrhage is not developed prior to the commencement of labor.

"2. It commences spontaneously, without an appreciable cause, and without any precursory phenomena; the woman being often suddenly aroused in the middle of the night by the blood escaping from the genital parts.

"3. When manifested for the first time, it is generally inconsiderable in amount and soon over; but, after having disappeared altogether, it returns, sometimes in the course of a few hours, at others, not for several days; and, at each reappearance, the discharge is a little more abundant, and, lasts somewhat longer.

"4. The cervix uteri (considering the period of gestation) is usually thicker, softer, and more spongy, because the placenta, by becoming fixed over this point, determines there a more considerable afflux of blood.

"5. If the labor has commenced, and the membranes are still intact, the flooding constantly augments during the uterine contractions, and diminishes in the intervals. But the contrary is observed when the discharge is occasioned by a separation of the placenta attached to any other point; for then the womb, by contracting, obliterates the vessels, either by a retraction of its own proper tissue, or by the compression they are subjected to from the parts inclosed within its cavity; but, in the case under consideration, the contractions that affect the dilatation of the cervix, destroy the vascular adhesions which unite it to the placenta, more and more, and thus multiply the sources of hemorrhage. This sign is one of great value before the membranes are ruptured; but, after the waters are discharged, the child's head presses on the orifice during the contraction, and prevents the blood from escaping.

"6. The bag of waters does not form as in an ordinary labor; for the insertion of the placenta over the neck closes its orifice, and prevents the lower segment of the ovum from engaging therein, and from being accessible to the finger.

"7. Lastly; according to Dewees, the blood has a brighter color at the onset of the hemorrhage than when it comes from the fundus, and coagula never come away, excepting when the discharge has lasted for some time, or is on the point of disappearing."

TREATMENT.—The treatment of cases of placental presentation will depend much upon the period at which the practitioner is called, as well as the attending circumstances. If called some weeks previous to full term, on the occurrence of the commencing floodings, and these are not very copious, the only measures required will be to keep the patient in a horizontal situation, on a hard bed and in a cool room, enjoining rest and perfect quiet; and, as in all cases of uterine hemorrhage, the bed should be placed so that the attendants can easily pass around it: internally, cold and acid drinks may be exhibited, and cold water or some cold astringent solution may be injected into the vagina. The covering should be light, and the bowels must be kept regular. In fulfilling this latter indication, care must be had not to effect active catharsis by internal agents nor by stimulating enema, as these will have a tendency to increase or cause a return of the hemorrhage—a consequence of straining or tenesmus, which may produce a removal of the coagula which are covering the lacerated bloodvessels. An injection of cold water is probably the best agent which can be employed to free the rectum, and it should be repeated, according to circumstances, once or twice daily, or every other day. Not unfrequently there will be more or less nervous irritability, generally arising from an excited and alarmed condition of the mind. The practitioner should always endeavor to tranquilize any mental agitation which may be present; and, to allay the excited condition of the nervous system, he may administer some compound powder of Ipecacuanha and Opium, or a pill of Opium, or some tincture of Hyoscyamus, either of which may be found beneficial. The diet of the patient must consist of light, nutritious fluids, avoiding all stimulating agents of whatever character, and this should be persisted in as long as may be deemed proper or necessary.

The hemorrhage having ceased, it must be borne in mind that it is liable to return at any moment, and may prove to be very excessive and serious. Before leaving the house, therefore, full instructions should be given to the friends for its management during the accoucheur's absence, as for instance, the above measures, with applications of cloths to the vulva, wet with cold water and vinegar. He should likewise strictly enjoin upon them to send for him instantly on its recurrence, and lest he may not be readily found, the services of another professional brother should be secured, in order that the female may not perish for want of proper attention. Beside, these measures show that the practitioner feels a deep interest for the welfare of his patient, secure her confidence as well as that of her friends, and add to his reputation. As soon as the causes of the hemorrhages are suspected, the friends of the patient should be informed, and the dangers to which she is exposed fully made known; but on no account should the patient be notified, lest it might hasten an unfavorable issue, by creating an intense nervous excitability with powerful mental agitation.

Should the hemorrhage be excessive, and resist the energetic measures employed to check it, or should uterine contractions, however feeble, be experienced, with even a moderate loss of blood, the practitioner should apply ligatures to the inferior extremities, and then proceed to a vaginal examination, as heretofore explained. If the os uteri be found rigid, resisting the introduction of a finger, no force whatever must be employed: the os uteri *must be soft and yielding, in all cases*, before any introduction of a finger or of the hand is to be attempted—to do otherwise is unpardonable. There may be cases, where the hemorrhage is very copious, with a rigid and unyielding condition of the parts forbidding the introduction of a finger for diagnosing, or of a hand for version, in which this rule may be violated, for the purpose of endeavoring to afford the patient the only chance for safety; but it is always hazardous, and most frequently terminates fatally. Generally, however, the rigidity of the os uteri will be speedily overcome by the great loss of blood.

In placenta prævia, the danger is from the hemorrhage, which increases when uterine contractions come on, or when dilatation of the os uteri is progressing; and the great and important question is, when to deliver? The established, and probably the safest method of delivery is, by turning and promptly bringing away the child. The operation has its dangers, but it is the best which can be pursued, and its success will depend greatly upon the skill and judgment of the accoucheur. If he waits for the complete dilatation of the os uteri before undertaking the operation, the exhaustion effected may be so great as to afford no hope for the patient's survival, or she may perish before such dilatation is effected. I would repeat, therefore, two great principles by which all medical men must be guided in their management of placenta prævia: — 1, never attempt to pass the hand within the os uteri when it is in a rigid condition; 2, never delay interference by version or otherwise, until full dilatation of the cervical orifice has been accomplished.

The time for operation has arrived, when the os uteri, being soft and yielding, has dilated to the size of a half dollar, or sufficient to easily admit the introduction of the points of the fingers and thumb: to wait for a greater enlargement of the orifice, would be to increase the hazards to the patient, because the hemorrhage becomes more and more copious and alarming as the development of the os continues to advance; to interfere sooner, would be at the risk of effecting considerable injury to the os uteri.

The requisite amount of dilatation having been accomplished, the female should be placed upon her back; or if the hemorrhage be excessive, or she be very much exhausted, she must not be moved, but the version must be effected while she is lying on her left side. The pelvic extremity of the patient should, if possible, be considerably elevated above the head, so that the body shall lie in an inclined position, the head being the lowest part, and this may readily be effected by lifting up the bedstead and securing the legs of one end on blocks of sufficient hight: this measure may preserve her from a fatal syncope. The operator must remove his coat, bare his arm, and having anointed the arm and fingers, proceed to the introduction of the hand into the vagina.

Before introducing the hand, however, it is of some importance to ascertain the position of the child; for should the wrong hand be employed at first, its removal will produce an increase of the flooding, and which may involve fatal consequences before the other hand can be entered. If the placenta be only partially attached over the os uteri, or if one side of it be wholly detached, the finger may be passed between the free end of the placenta and the uterus until it reaches the membranes, when the position may be ascertained through these; or if this cannot be done, and the patient be not too corpulent, an external examination over the abdomen, in the absence of pains, may detect the globular head at the lower portion of the belly, and the curve of the child's spine being found on the right or left side, will determine its position. This cannot, however, be easily ascertained in all cases, and the practitioner will then employ his left hand, on the presumption that the head is in the most usual position, or that in which the occiput looks toward the left acetabulum.

"In every case, before attempting to turn, make a most careful examination of the os uteri, and endeavor, from the degree of dilatation, and the thinness and softness of the orifice, to form a correct judgment upon its dilatability before interfering; for if your attempt be unsuccessful, the hemorrhage will be renewed, and the patient will be placed in a worse condition than she was before."—(*Lee.*)

The fingers and hand are to be slowly and carefully passed within the vagina, in a conical form, as heretofore explained, (page 396), and carried up to the os uteri. As the fingers are insinuated within the os uteri, they should also gently dilate it, advancing upward between the free or detached side of the placenta (which must be detected by a careful exploration, as already referred to), and the inner surface of the uterus. If the placenta be not sufficiently separated to admit of the entrance of the hand, an artificial separation must be cautiously effected, selecting, when possible, that side of the placenta for the detachment which is ascertained to be the thinnest, which will be the nearest to its edge, and where, consequently, the uterine bloodvessels will be the smallest. As soon as the fingers have entered the os uteri, a greater or less discharge of blood will almost always follow, but at which the practitioner must not be alarmed; firmness, self-possession, and gentleness are required; and should the practitioner, alarmed at the fresh discharge, attempt the withdrawal of his hand at this time, a fatal increase of it would very probably be the result. As soon as the hand has thoroughly entered the uterine cavity, the wrist or arm prevents any further material loss of blood, by compressing the orifices of the bleeding vessels.

The hand should be passed as high up between the uterus and membranes as possible—these should then be ruptured—the hand carried within, and the feet of the child be obtained. If both feet can not be readily found, the version may be effected by one only, instead of delaying the delivery by a prolonged search for the other. The version should be carefully effected, but with as much expedition as is consistent with the safety of the child and patient, and the limbs should be brought down into the vagina until the hips or body of the infant is in contact with the uterine cervix; and this is to be performed, not only to facilitate delivery, but that the compression of the bleeding vessels by the fetal pelvic region may check any excessive hemorrhage.

A sudden removal of the contents of the uterus might give rise to inertia of the organ and fatal flooding; therefore, unless the copiousness of the discharge requires the immediate delivery of the child, this must not be effected. And in every case of hemorrhage from placental presentation, as soon as the version is completed, a full dose of Ergot should be administered, not so much for the purpose of aiding in the expulsion of the child, as to secure permanent contractions of the uterus subsequently. For it must be remembered, that the life of the patient depends entirely upon perfect and persistent uterine contractions. Beside the Ergot, frictions, and other means which have been heretofore spoken of, to arouse or preserve the action of the uterus, may be employed. The bandage should never be omitted.

Some writers recommend the perforation of the placenta itself, but this is a very difficult operation, and when accomplished, may effect the death of the child and mother from augmented hemorrhage occasioned by the certain rupture of large bloodvessels, or from a delay or difficulty in the passage of the child through the insufficient opening made by the hand. It should never be attempted.

The practitioner may, however, be called to a case of this nature, where the hemorrhage is copious and frightful, before the os uteri is sufficiently dilated, and in which delay would be death. If the os uteri be found rigid and unyielding, no attempts at forcibly entering it with the hand are justifiable—such attempts are always dangerous. The only course to be pursued is to procure, if possible, a diminution of the discharge, until the os uteri is in a more favorable state. For this purpose, ligatures should be applied to the extremities, the patient should be kept quiet in a recumbent position with the hips slightly elevated; vaginal injections of cold water, or cold astringent solutions, with cold applications to the external parts, nates, thighs, etc., should be persistently employed. Cold, acidulated, or astringent draughts should be administered internally, and the vagina may likewise be plugged with a tampon wet with a solution of Alum, and which will occasionally be found useful. In the early part of this work I stated that the tampon was not to be used in hemorrhages from the uterus, occurring after the fifth or sixth month. The present instance may, however, be considered an exception, as there can not be a concealed hemorrhage to any great extent so long as the membranes remain entire, and the cavity of the uterus is not in a condition to receive a large amount of blood, except such as may pass between the inferior part of the membranes and the cervix, unless, indeed, the organ be in a very lax condition with great prostration of the vital forces. Beside, the use of the tampon does not dispense with the careful watching of the patient, observing the features, the pulse, etc. When no unfavorable symptoms follow the employment of the tampon, its removal will be indicated by the strength and frequency of the pains. I do not recommend the use of the tampon in partial placental presentation, but only in those instances where the membranes can not be reached on account of the internal orifice being wholly occupied by the after-birth. In many instances, notwithstanding the use of all the above measures, the flooding will continue unrestrained; it then becomes necessary to hasten the delivery by all possible means. Generally, the rigidity will be speedily subdued by the great relaxation produced by the excessive loss of blood, when the following course may be attempted:

But if, instead of a rigid condition of the os uteri, a soft, dilatable one be found, however small the opening, the hemorrhage being, as above remarked, frightful, the fingers may be carefully entered within the orifice one by one, gradually dilating it as they proceed, until the hand can be so far introduced as to effect the version. This is not a desirable method, neither is it of easy performance, and being always, more or less hazardous, should never be undertaken except under imperative circumstances; it then becomes the best and only course left us, and should be employed with all the precautions which a knowledge of its disadvantages and dangers would suggest. In these frightful cases a delay may be fraught with fatal results. "As a principle, delivery had better be had recourse to an hour too soon than an hour too late." "It is the loss of the last half pint of blood that kills the patient." "Sometimes, when in these cases, it is impossible to pass the whole hand through the os uteri, the delivery may be safely accomplished by merely passing one hand into the vagina, and afterward the fore and middle fingers between the uterus and detached portion of the placenta, grasping with them the feet, which are generally situated near the os uteri, and drawing down the inferior extremities into the vagina and delivering."—(*Lee.*)

In these cases, the physician should always have his forceps at hand, in order to extract the head, should any delay or difficulty occur in its delivery.

When the placental presentation is PARTIAL or INCOMPLETE, that is, when its edge extends only to the margin of the os uteri, or perhaps, covering one-third, one-half, or any other proportion of this orifice, the remaining part presenting the membranes, symptoms of a character similar to those in complete placenta prævia will be met with, requiring a somewhat analogous treatment. This form of placental presentation is of more frequent occurrence than the complete.

When labor is on, and the hemorrhage is profuse, the best course is, to rupture the membranes, without regard to the extent of dilatation of the os uteri, which, by allowing the liquor amnii to escape, will permit the head or breech, as the presenting part may be, to descend and compress the bleeding orifices, thereby checking or diminishing the flooding. At the same time, the tincture of Gelseminum may be exhibited to forward the dilatation of the os uteri, while the bandage may be applied, and other means used to cause vigorous uterine contractions; and, at the proper period, Ergot may be given to facilitate the expulsive process, but this drug must not be administered when the natural efforts are all-sufficient, except it be for the purpose of securing permanent contractions after the delivery.

Should this course fail, the hemorrhage continuing, or, should there be exhaustion of the system, from the amount of blood lost, the better plan will be, to rupture the membranes and turn, being governed by the rules already laid down for version in complete placental presentation.

In case the liquor amnii has been discharged, and version is desirable, the hand will find but little difficulty in entering within the uterine cavity, because, the excessive flooding will effect a lax, yielding condition of the parietes of the organ; this is unlike preternatural presentations, in which a loss of the amniotic fluid is followed by energetic contractions, rendering it almost impossible to introduce the hand for the operation of turning. Beside, in placenta prævia, should the contractions be sufficiently vigorous to advance the head, the pressure made by it on the orifices of the vessels will diminish the flow, and there will then be no necessity for the introduction of the hand, as the delivery will be effected by the natural powers, except indeed, the pelvis be malformed, or the soft parts be rigid and unyielding.

In preternatural presentations of the fetus, with placenta prævia, or in a small or deformed pelvis, it will be proper to turn, provided the hand can be introduced for the purpose—and, in the latter instance, when the head can not descend, or pass through the cavity and inferior strait, it will require the use of the perforator to terminate delivery.

The treatment after delivery will be in accordance with the rules hereafter given, endeavoring to produce persistent uterine contractions which will prevent a return of hemorrhage—also to sustain strength, and allay the irritable condition of the system.

CHAPTER XXXVI.

COMPLICATED LABOR.—HEMORRHAGE FROM PLACENTA PRÆVIA (*Continued*)—SYNCOPE FROM HEMORRHAGE.

In hemorrhage from placental presentation, as well as in all puerperal hemorrhages, there is one very important symptom to which the attention must be especially directed—I mean SYNCOPE, or a state approaching to it. When the female has lost a large amount of blood the practitioner will probably find her pale, cold, and gasping, the uterus torpid and exceedingly flabby, the pulse nearly gone, with a fluttering of the heart, and a greater or less degree of insensibility. Upon an examination the flow of blood will be found suspended; but in making the examination, when the above symptoms are present, the greatest care must be had not to disturb the patient, or pass the finger into the vagina—it must be ascertained from the appearance of fresh cloths applied to the external parts. In such cases, the patient must not be moved—a change of position frequently results fatally; neither must any manual operations be performed for the purpose of emptying the uterus or otherwise endeavoring to promote its contractions. Should the patient be not altogether insensible, she will manifest an intolerable restlessness of disposition, a desire to change her posture, which, if acceded to, will occasion sudden death. If the hand be introduced within the uterus, for any purpose whatever, a disturbance of the coagula will immediately renew the flooding, and sudden death will almost certainly take place.

Instead, therefore, of rendering useless attempts at any manual operations, the practitioner should employ measures to rouse the sinking system, and sustain the strength of his patient, until she has so far recovered, that, attempts may be made to empty the uterine cavity, if necessary. And to accomplish this indication, stimulants must be given. Brandy, Rum, Ether, Ammonia, or other cordials may be administered. If the spirituous preparations be used, it is better to give them undiluted, if the patient can bear it, because it will require a less amount of fluid to be thrown into the stomach, and this organ will be less likely to reject it. These stimulants must be persevered in, until they have exerted a decided, but not too highly stimulating influence upon the system as manifested by an increase of the pulse, an augmentation of the temperature of the extremities, a reddening of the lips, and a return to consciousness; and when these symptoms present, the further exhibition of stimuli may be dispensed with. In cases of this character the stomach will be nearly as insensible as the rest of the system, and will not be so readily acted on by these cordials as when in a more healthy and vigorous condition; one or two fluidounces of undiluted Brandy may be given at a dose, and repeated every five, ten, or twenty minutes according to the degree of depression of the vital powers.

But, not unfrequently, with the fainting or syncope, there may be a continued flow of blood; this is a very serious condition, especially if the female be sinking rapidly. Under these circumstances, the object will be to suppress, if possible, the hemorrhage, and for which it is difficult to give any specific rule. The rupture of the membranes followed by a discharge of the liquor amnii, or the removal of the fetus, or the delivery of the placenta, may either of them be followed by contractions of the uterus, and a consequent suppression of the flooding, and thereby prove the safest course to adopt; while on the other hand, and particularly if the female be much exhausted by the drain from the system, and the syncope be long-continued or extreme, the wiser course will probably be to refrain from all operations, trusting to the natural resources aided by the general external and internal measures usually employed in severe hemorrhages, without any disturbance of the patient's position.

From the infrequency of placenta prævia, it may be considered that too much space has been occupied with its nature and treatment; but, if a trial of the means herein-named will contribute to the preservation of but one life, it will amply repay for the time and space accorded to it. And, that the reader may be well posted in the management of this difficulty, at the risk of some repetition of what has been just stated, I give the following valuable remarks upon its treatment, from the pen of my colleague Prof. C. H. Cleaveland, who has kindly furnished them for the present volume:

"° ° ° —It is probable, that the accoucheur meets with no other condition of affairs, demanding a more thorough acquaintance with his profession—more prompt action, or cool intrepidity, than when called to a case of placental presentation; and hence the necessity for a careful and somewhat full delineation of all the circumstances that may attend this form of complicated labor. From the nature of the case, it will be apparent that in placenta prævia, there must be a greater or less loss of blood, at any time when the os or cervix uteri dilates or develops itself, and, that several repetitions of these floodings, or, even one, if it be sufficiently copious, may not only induce great prostration of the vital powers but may prove destructive to the life of the patient. ° ° °

Should the placental mass be soft and tender—the os dilate rapidly, and the expulsive power of the uterus be sufficient, the head, or any other presenting part of the child may be pushed through the placenta, and then its presence within the pelvis, may so lessen the diameters of that canal as greatly to embarras the further progress of the labor, and, perhaps, endanger the life of the child. Or, as the os uteri dilates, the placenta may be entirely detached from the uterus, and be expelled—the child, probably, dying before it can be delivered either from hemorrhage through the umbilical cord, or from the want of the vital power it has been accustomed to receive from the circulation of the mother.

If relief be not afforded, a fatal termination may be anticipated in the great majority of cases, and hence the necessity for knowing how to detect the danger at the earliest possible period, as well as to know how to manage the case when its nature is ascertained. ° ° °

Although it might be supposed that the duties of the accoucheur only begin with the commencement of labor, yet such is not the fact in cases of placental presentation. When we consider the location of the cake, as has been detailed, over the os externum, and recollect the changes which occur in the cervix of the uterus after the middle of the sixth month, we shall perceive that frightful hemorrhage may suddenly occur at any time, even during sleep, and the physician may be sent for on the supposition that labor has already commenced.

These accidents may, and frequently do occur repeatedly during the last few weeks of pregnancy—and the gush of blood may repeatedly be mistaken for a rupture of the membranes and a flow of the liquor amnii, and the error only discovered by the physician finding the underclothing drenched with blood. When this accident occurs without any unusual mental or physical exertion, during the last weeks of gestation, the possibility of dislocation of the placenta should be borne in mind, and proper admonition be given the patient and her friends. If it has occurred two or three times, the probability of a presentation of the placenta becomes very strong, and the danger attending this untoward state of affairs within the uterus should be explained to the friends of the patient, and the strictest regimen, both mental and physical, enjoined with all the authority of—the physician.

It is useless to make vaginal examinations by the speculum, or otherwise, as, the difficulty being *within* the cavity of the uterus, and the os undilated, no information can be gained by these manipulations, but the woman may be seriously injured by them. Neither can much be gained by local applications in the vagina, or rectum, except by the application of cold, as the injection of cold water.

The hemorrhage previous to full term being mainly from the vessels of the placenta (for the very act of development on the part of the uterine neck, which separates the placenta, tends to close the ruptured vessels within *its* walls), but little benefit can be derived from the application even of cold, and any astringent, styptic, or sedative medicine can be absorbed into the general circulation far more readily and promptly from the stomach, than from the rectum or vagina.

But the physician *can* take off the pressure of blood upon the ruptured vessels. He should not bleed, as has been recommended by some authors, because the vitality of the system is already more than sufficiently reduced; and the loss of blood, whether from the uterus arm, only makes that fluid thinner and less capable of form necessary clot to plug up the ruptured vessels; but he should at once (if the hemorrhage has not ceased before his arrival) ligate both limbs high up around the thighs, and then apply stimulants and warmth to the extremities, to invite into the limbs and to retain there as much of the vital fluid as possible. By these means a large amount of blood may be withdrawn from the general circulation, and kept in reserve for use after the immediate danger has passed.

At the same time, astringent medicines should be administered, and for this purpose *Alum* is probably unequaled; for, being very soluble, it is readily absorbed into the circulation, and acts both to astringe the muscles of the bloodvessels and to coagulate the albumen of the blood, so that while it lessens the orifice of the bleeding vessels, it also aids in the formation of the clot to plug them up. To insure its absorption into the circulation, it should be given in a solution with sufficient water, whose specific gravity does not exceed twenty degrees above that of water; for should it be over twenty-five or twenty-six degrees heavier than water, instead of passing through the coats of the stomach and entering the circulation, it will cause endosmose of the blood serum, and induce either emesis or catharsis.

The Alum, then, should be administered in not too large doses, say from ten to fifteen grains in a wineglassful or more of water, and repeated as often as the attendant thinks it is absorbed from the stomach.

At the same time, a sedative to the heart should be administered, and for this purpose Opium is usually chosen. As it puts a stop to the flooding, it has acquired the reputation of being an astringent, but we have no evidence that it possesses such a power. It *does* act upon the vagus and the sympathetic nerves as a sedative, lessening the force and frequency of the heart's contractions, and hence lessens the pressure of the blood upon the ruptured vessels, and in this way tends to check the flooding. Were it the only agent we have which acts thus, or were it not liable to induce other and unfavorable changes in the system, it would be invaluable in these cases; but we *do* possess other agents even superior to it in their power of controlling the muscular contractions of the heart, while they are not obnoxious to the grave objections that obtain against the use of Opium.

Of the sedatives to the heart, the tincture of Gelseminum is the most powerful one known to the profession, and it does not appear to possess a single objectionable property. It should be administered in full doses, say from ten to twenty drops, and in some cases even more, and the dose repeated every fifteen or thirty minutes, until the muscular system and the heart are strongly co[illegible]t. The practitioner should not fail to remember that the speed with which medicines are absorbed, and produce their effects, is greatly enhanced by the loss of blood; and he should also bear in mind that the greater the loss of blood, the smaller will be the dose required to produce an influence. Especially is this true of all sedative medicines; and many patients have been destroyed by abstracting blood from them while suffering from the depressing effects of a dose of Opium.

Should the physician discover that the loss of blood has so enhanced the action of his sedative as to produce unnecessary depression, he should at once administer the Carbonate of Ammonia, in proper doses, as a stimulant. He must not give Alcohol in any form, for it tends to liquefy the blood, and, also, secondarily will prove a sedative instead of a stimulant.

Absolute quiet in the horizontal position, on a hard bed, and in a cool room, with as little covering as will prevent suffering from cold, must be strictly enjoined, and the ligatures must be retained around the limbs, changing their location as may be demanded, until the present danger has entirely passed. No stimulating food or drink, nor any sources of mental excitation, may be indulged in, but cool drinks and mild, nourishing food may be taken in sufficient quantities to satisfy the demands of the system. No violent purgings or other undue excitations are admissible, but the bowels should be kept soluble by the daily administration of the requisite amount of the Seidlitz powders, or some other saline laxative, which will tend to abstract from the blood its more fluid portions.

As a return of the hemorrhage may occur several times previous to confinement, and is almost certain to be present to an alarming extent at that time, it will be proper that another physician be called in, to whom the nature of the case and the plan of treatment are made known, so that should the attending physician be deterred from visiting at any time, this professional friend may be prepared to carry out his plans.

Such are the modes of treatment demanded in those hemorrhages that occur previous to the commencement of labor.

When the full period of gestation arrives, the mouth of the womb will begin to dilate, and more bloodvessels will be ruptured, so that the hemorrhage will probably be more profuse than at previous attacks; and as the labor continues to advance, it will not cease so speedily nor so readily as in former times. As soon, then, as the flooding is accompanied with labor-pains, a cautious but thorough examination should be instituted, the limbs should be ligated as before directed, the patient should be placed in the horizontal position, the tincture of Gelseminum should be administered, both to quiet the heart's action, and to produce relaxation of the muscles of the lower half of the uterus, so as to allow dilatation to proceed as rapidly as possible; and having the proper instruments in readiness, and, if possible, the attendance of a friendly physician, the accoucheur should, as soon as the os uteri has dilated so as to admit the points of his four fingers, proceed to introduce his hand into the vagina, and as fast as possible, without too great violence, into the uterus, not through the placenta, but carefully separating this organ from the uterus and cautiously pushing his hand forward until it is within the uterine cavity. Then, without delay, he should rupture the membranes, and pass his hand up until he can grasp one or both feet; or if he cannot reach these, he may seize the knees, and turning the child, the labor must be hastened as rapidly as possible.

If the patient be of spare habit, the position of the child may sometimes be ascertained with considerable certainty by an external examination over the abdominal protuberance; but if nothing can be determined in this manner, the practitioner is to proceed on the supposition that the child lies in the natural position, with the vertex to the left acetabulum, and face to the right sacro-iliac symphysis.

The modus operandi of turning, in cases of placenta prævia, does not materially differ from the same operation in other conditions. I prefer the woman to lie upon the left side, with the hips near the front of the bed, and well elevated,—both because there is thus more freedom in manipulating, and because the danger from hemorrhage is lessened as the hips are elevated, and the head, trunk, and extremities depressed. The hand is to be formed into a conical shape, the fingers being drawn to a point, and it is to be passed to that side of the uterus where the placenta is most easily detached, and then introduced high up within the uterine cavity before the membranes are ruptured, in order to allow as much of the waters to remain in the sac as possible, until after the version of the fetus.

Previous to the manipulation, a dose of Ergot, or some other special stimulant to the uterus, should be prepared, so that as soon as the feet and limbs are drawn through the os uteri into the vaginal cavity. It
may be administered for the purpose of insuring the uterine
tions with the further descent of the child. Not only shoul
be given as soon as the feet are brought down, but press
friction should be applied to the uterine tumor throug
walls—care being exercised not to press the fundu
its own cavity.

The operator should bear in mind, that after he has passed his hand within the uterus and separated the placenta from its attachment, delay, or hesitation, or a withdrawal of his hand, will be almost certainly followed by fatal hemorrhage; and that the safety of both mother and child will depend, in a great degree, on his firmness, presence of mind, and knowledge; and, regardless of the views or pleadings of the patient or her friends, he must firmly persevere until delivery is effected, unless some very extraordinary difficulty shall prevent.

I well know that many entertain a strong and honest prejudice against the use of Chloroform in labor, but from a not very limited experience of its use in my own private practice, as well as from the testimony of others in its favor, I should, when treating a case of this nature, insist on its exhibition, at least during the process of version, and until the hips of the child had been brought into the pelvis so as to check a further flow of blood.

Chloroform, in its secondary action, in a slight degree resembles the action of Gelseminum, and hence the necessity of precaution in the combined use of these agents. The first action of Chloroform is that of a stimulant, mainly on the mental organs, which it excites and then leads astray. And its later or sedative effect being mainly spent upon the nerves of sensation, and not of muscular motion, renders it admissible to give it and the Gelseminum in conjunction; but inasmuch as Chloroform does depress the muscular power of the heart, the above caution in regard to the combination of it with Gelseminum is deemed necessary.

The presence of the hand and arm, while they occupy the pelvic canal, press upon the open mouths of the ruptured vessels and prevent any serious hemorrhage; and when the body of the child is in the same position, it answers the same desirable purpose, so that time can be allowed for the uterus to contract.

Some authors have proposed to push the hand directly through the placenta, but this proceeding is objectionable from three causes. 1st, By this means many of the larger bloodvessels of the placenta must be ruptured, thereby greatly augmenting the hemorrhage; 2d, The hand would be likely to pass into the cavity of the membranes at its lowest point, and thus give free exit to the waters, which it is desirable to retain, as the child can be more readily turned when floating in them; and 3dly, The ruptured placenta may surround the child on its descent into the pelvic canal, and, lessening its caliber, may greatly retard the exit of the hips, shoulder, or head.

Others have proposed that the placenta be entirely separated from its attachments and removed; but this cannot occur without an exit of the waters, thus embarrassing the passage of the child; and also, if the placenta be detached, there is great liability of the child's death from the free discharge of blood from the placenta, and the consequent drain of the vital fluid from the system of the fetus.

Sometimes the placenta will be expelled before the physician has arrived, or before he has had time to pass it to one side; and then the danger of death to the child is imminent indeed: perhaps, by promptly ligating the umbilical cord, it may yet be saved from fatal hemorrhage.

It has been proposed to place the expelled placenta in a ewer of warm water; but what the eminent men who propose this method of procedure expect from its adoption, does not appear very distinctly. The warm water cannot be sucked up by the umbilical cord to enter the fetal circulation, but the warmth and moisture can, and will, make the loss of blood more profuse, and consequently increase the danger.

The detachment and expulsion of the placenta, especially if it also be quickly followed by the fetus, is attended with great danger to the mother, from the sudden shock the system receives when debilitated by the profuse loss of blood.

We are all aware that the sudden evacuation of a large quantity of water in ascites, is almost certain to be followed by alarming syncope; and the same conditions which produce the faintings after tapping, are present when the gravid uterus is suddenly emptied of its contents. Hence, the elder and the younger Ramsbotham have recommended that in these cases great care should be taken not to entirely empty the uterus too rapidly. In addition to this, I would also advise that a properly adjusted bandage be so applied that it may readily be made to press upon the abdominal walls, and thus prevent the syncope, and even the internal hemorrhage which might be present, were these precautions omitted.

As stimulants will be indicated by the great prostration of the system, the friends of the patient may wish to ply her with alcoholic drinks in some form. This must be most strenuously forbidden, for all the inebriants tend to liquefy the blood, to excite the system, and after the stimulating stage has passed, to produce great physical and mental prostration.

Ammonia, especially the carbonate, may be freely given, along with an infusion of Cinnamon, or a very small amount of the essence of Cinnamon; and the woman must be kept quiet and cool, with the hips and extremities elevated, and the head and chest depressed, and in time she will rally so as to be past danger; but if inebriants be allowed, although they may at first appear to exalt the vital powers, this exaltation will be fleeting, illusive, and be soon followed by still greater and more dangerous prostration."

CHAPTER XXXVII.

COMPLICATED LABOR.—ACCIDENTAL HEMORRHAGE—CONCEALED HEMORRHAGE—HEMORRHAGE AFTER PLACENTAL DELIVERY—EFFECTS OF LOSS OF BLOOD.

THE SECOND FORM of puerperal hemorrhage is that which occurs in the latter weeks of pregnancy, as well as during labor, in which the placenta is not attached to the cervix uteri, but to some other portion of the uterine parietes. It includes hemorrhages at any stage of labor previous to the birth of the child; as, before the rupture of the membranes, after the evacuation of the amniotic fluid, after the expulsion of the head, and during the presence of the shoulders in the pelvic cavity. It has been termed *accidental* or *concealed* hemorrhage.

The immediate cause of this kind of hemorrhage is the separation of a part or the whole of the placenta from the uterus, and which may be the result of severe or sudden shocks, as blows, falls, undue pressure over the hypogastrium, mental agitation, excessive laughter, straining at stool, etc.; more commonly, it is owing to some internal cause, as shortness of the umbilical cord from surrounding the child's neck or body, abnormal condition of the placenta, etc. Occasionally it takes place without any discoverable cause.

More commonly, accidental hemorrhage is not observed until after the commencement of labor; but it frequently happens that there may be one or more discharges of blood for some weeks previously. These early discharges may determine the character of the difficulty, and its disconnection with placenta prævia, by observing that, in almost all instances they have been preceded by some sudden or unusual shock, while in placental presentation, the flooding occurs suddenly without any previous excitement or injury, and frequently happens during sleep.

The hemorrhage may immediately manifest itself upon the presence of the exciting cause, or it may not appear for a greater or less time subsequently, being preceded by uneasy sensations, and an aching and dull pain in the back and abdomen. Its quantity may vary from a few ounces to an amount sufficient to speedily destroy life, being generally proportioned to the extent of surface exposed; but, very frequently, fatal flooding occurs where the exposed space scarcely exceeds an inch square. And it may, or may not, be accompanied by labor-pains, depending, however, upon the period of gestation when it happens; but should this be at full term, and the pains present, the hemorrhage will be checked while they are on, but will return again during the intervals between them.

It must be recollected that, there may be a very serious hemorrhage going on internally, without the appearance of a single drop of blood externally, and if the practitioner is not aware of this fact he may lose his patient, even before he suspects the true state of her case. Therefore, we are never to judge of the condition of the patient by the amount of blood which has been discharged externally—and this rule will hold good in all puerperal hemorrhages—but, by the general symptoms of exhaustion, as rigors, weight or sudden distension of the uterus, faintness, nausea, vomiting, coldness of the extremities, feeble but rapid pulse, hurried breathing, paleness of countenance, sighing and yawning, and, if the discharge be not arrested, intolerable restlessness, dimness of sight, ringing in the ears, hiccough, and death preceded by syncope or convulsions; and these symptoms may be present when the vaginal discharge is so slight as hardly to attract any notice. Usually, when syncope occurs, it is followed by a suspension of the hemorrhage, which reappears as often as the patient becomes conscious, and thus syncope and hemorrhage may continue to alternate with each other, until the fatal moment arrives.

DIAGNOSIS.—In all cases of puerperal hemorrhage occurring previous to the birth of the child, it is an imperative duty on the part of the medical attendant to institute a careful examination per vaginam, in order to ascertain whether or not the placenta be completely or partially over the inner os uteri. Of course, if the hemorrhage should be present previous to the commencement of labor, the os uteri will be found undilated, and no information can be had by the examination. If, however, it happens at term, and especially if pains are, or have been recognized, the cervix will be found relaxed and yielding, a result caused by the hemorrhage, and we can usually introduce the finger within the os uteri so as to detect either the membranes or the placenta. In the flooding under consideration, the finger will not find the placenta at any part of the os uteri; this latter will be free, its marginal circumference will be of the same thickness all round, and the membranes only will be felt in contact with the point of the finger when this is advanced upward.

Beside this investigation, which should, as before remarked, always be made, there are several signs which will materially assist in the diagnosis. Thus, in accidental hemorrhage, some previous excitement or shock will generally have occurred; if the pains are on, the hemorrhage is arrested by them, but recurs during the intervals — in unavoidable hemorrhage the discharge continues during the intervals, and is augmented by the pains.

TREATMENT.—The treatment of accidental hemorrhage will vary according to the quantity of blood lost, the period at which it occurs, and the condition of the os uteri. When it occurs previous to full term, labor-pains being absent, and no tendency to dilatation on the part of the os uteri, the hemorrhage not being so profuse as to impair the constitutional powers, we should endeavor by all means to stop it, and prevent if possible, its return.

The patient should be kept in a horizontal position, on a cool, hard bed; her covering should be light, and the surrounding temperature of the room should be considerably reduced. Cold water only should be allowed, or ice; or the water may be acidulated with mineral acids, which exert no injurious influence and are usually acceptable. Injections of cold water, and cold applications over the external organs will frequently prove advantageous, but these should not be used when the system has become excessively depressed. The plug or tampon, is advised by some writers, but I consider its use contra-indicated, from the fact that an external flooding may be changed into an internal one. The patient must not be allowed to get up for any purpose whatever, and in the alvine evacuations, especially to lessen straining efforts, it will be better to aid by rectal enemata.

Should the flooding be very excessive, some of the means hereafter named, under the treatment of hemorrhage after the delivery of the placenta, may be employed, as, ligating the limbs, tincture of Cinnamon, or its combinations, oil of Erigeron, etc., etc.

When, notwithstanding all our efforts to check the discharge, it still continues, we can not expect that pregnancy will persist to the full period, and the only course that can be pursued to permanently arrest the hemorrhage and lessen the dangers to the female, will be to effect an evacuation of the uterine contents. The palliative measures will now be of no avail.

The proper course, then, will be to rupture the membranes, and favor the escape of the amniotic liquor, by holding up the child's head; the contractions of the uterus may be excited by the application of the bandage, by gentle pressure made around the os uteri with one or two fingers, and ergot and stimulants may be advantageously exhibited. In these cases, the os uteri will most commonly be found soft and dilatable, but should it be rigid and undilated, the rupturing of the membranes should not be attempted until this condition is overcome, and which may be readily accomplished by the tincture of Gelseminum, tincture of Lobelia, or other means heretofore explained.

The discharge of the waters, and the employment of the measures named, will, in the majority of cases, cause the uterus to contract and speedily evacuate its contents, and which action is almost invariably accompanied with a cessation of the hemorrhage. True, the life of the child may be endangered, but this is never to be taken into account when the mother's life is at stake.

I am aware that several writers have objected to rupturing the membranes in these instances of flooding, but their objections appear to me very insufficient, and the testimony of many eminent accoucheurs, together with my own experience, justifies me in strongly recommending this method, instead of immediate delivery by turning; the hand should in no case be passed into the uterine cavity, unless the safety of the female imperatively demands it; and it must be borne in mind, that in cases of uterine hemorrhage, where the membranes are felt at the mouth of the uterus, turning is very seldom required, though it is always necessary in complete placental presentation. Sometimes, after the membranes have been ruptured and the above means used to arouse uterine action, nothing will be accomplished, the hemorrhage will continue, and the treatment will fail to bring about the desired contractions; this, however, is not apt to occur, unless the attendant has too long delayed the operation, or, where the whole or nearly the whole of the placenta has become detached, and an excessive internal hemorrhage has consequently ensued. In these cases of failure it will become necessary to effect the delivery by turning, the employment of the forceps, or the perforator, as the exigencies of the case may demand. When a preternatural presentation is ascertained in these cases of hemorrhage, it then always becomes necessary to effect version as speedily as possible, but not before the os uteri is in a proper state, leaving the subsequent delivery to the natural powers when these are efficient. When the hemorrhage has occasioned great exhaustion of the system with syncope, the discharge being suspended, as heretofore observed, the practitioner must be extremely cautious how he attempts, or proceeds in his manual operations.

Should there be any delay in the delivery of the placenta, it is generally better, in cases where the hemorrhage has been profuse, to extract it, in order to secure permanent contraction of the uterus and thereby lessen any tendency to a continuation of the flow; and every means and care must be employed to guard, not only against a return of the flooding, but also against an attack of inflammation. After the delivery, the female should be managed as hereafter advised.

The THIRD DIVISION of puerperal uterine hemorrhage, is that which occurs after the delivery of the child, but before the expulsion of the placenta; it is frequently met with in practice, and usually comes on suddenly and in excessive quantity, greatly alarming the patient and her friends. The cause of this flooding is, as in the previous ones, a more or less complete detachment of the placenta from the uterine walls, with inertia or inefficient action of the uterus. It may occur in instances where previous pains were feeble and with long intervals, as well as in cases where the labor had thus far been prompt and energetic; and it is frequently manifested even when the preceding stages of labor had been most prudently and skillfully managed. The recommendation, heretofore given, that after the birth of the child the accoucheur should ascertain whether the uterus is contracted or not, by placing his hand upon the abdomen of his patient and feeling through its parietes for that organ, is one which should never be omitted, a rigid observance of this rule will keep him thoroughly informed as to the condition of the gestating organ, so that he can always be ready for prompt measures whenever required.

In these instances of hemorrhage, shortly after the birth of the child, or, perhaps, immediately succeeding it, a profuse quantity of blood is suddenly and rapidly discharged, and the first indications which the practitioner receives of the danger, are the pallid countenance, and the rapid and feeble pulse of his patient, with syncope, or a state approaching to it. On placing his hand upon the abdomen, the womb will be felt soft and flabby, and perhaps, somewhat enlarged; in a state of contraction it always offers a firm, hard resistance when pressed upon. The female soon becomes utterly unconscious, even before complete syncope has ensued, being unable either to see or hear anything around her, and if relief be not promptly given, the hemorrhage will speedily prove fatal.

TREATMENT.—In all cases of hemorrhage previous to the delivery of the placenta, there is but one course to pursue, and that is, to artificially separate and remove the placenta, and "no man is thoroughly prepared to undertake the charge of a common midwifery case, who would hesitate to pass his hand into the uterus and remove the placenta, whether adherent or detached," in a dangerous flooding of this character; and in my opinion, the sooner this operation is attempted, the greater is the security afforded to the woman; do not wait for the hemorrhage to become profuse and exhausting before interfering.

The suddenness and profuseness of the discharge may at first startle the young accoucheur—but he should not hesitate, and tamper with the case by endeavoring to extract the placenta with pulling upon the cord, because, he may invert the uterus, or else break the cord off in the neighborhood of the after-birth, in either case, increasing the danger. Neither should he attempt to overcome the hemorrhage by internal or external means alone—leaving the introduction of the hand as a dernier resort—because, in these cases, a few minutes are of immense value to the patient—and such delays are trifling with her life. If the practitioner becomes excessively alarmed, or loses his presence of mind, and feels a hesitancy as to the course he should pursue, he should not attempt interference lest he might increase the hazards, but should at once send for council.

On the manifestation of the hemorrhage, he will immediately place a bandage around his patient's abdomen with a compress beneath it to make pressure upon the uterine fundus, and will have the whole firmly secured. Then removing his coat, and rolling up his sleeves, he will gently stretch the cord with his left hand, and following it as a guide, conduct his right hand to the placenta; if on entering the os uteri, this be found contracted, it may be sufficiently dilated as the fingers and hand pass through it. Upon reaching the placenta, the fingers should be extended to its circumference, and its adhering portion slowly and cautiously detached, being careful that the separation is complete before attempting its removal from the uterine cavity. After the placenta has been reached, the other hand should be placed externally upon the abdomen of the patient to support and steady the uterus, otherwise, it will be very apt to move about, and retard the operation. The operator must bear in mind that by following the cord he will reach the fetal surface of the placenta—and should he become embarrassed by the membranes in his search for its periphery, the hand should be withdrawn to the cervix, placed against the uterine walls, and the fingers carefully passed along to the placenta.

In separating the placenta from the uterus, the fingers must not be passed rudely or carelessly between the adhering surfaces, lest some portion of the uterine surface be injured by the nails, or otherwise; neither should the practitioner seize the free part of the placenta and draw it away, lest some of the unseparated placenta be torn off and left behind to continue the hemorrhage and render it fatal, or, at all events to decompose and ultimately to give rise to the usual symptoms of putrefactive absorption. But, he should press upon the placenta at its attached points, with the ends of his fingers, carefully pushing or pressing it off, as though he were removing the peel from a thin orange, without disturbing the inner tunic of the fruit or causing any of its juice to exude.

The placenta being detached, the uterus will commonly contract and expel it and the hand together; or the means heretofore advised for causing contractions may be employed—and after the expulsion, contractions occurring, the hemorrhage will cease. However, should it still continue, it must be treated the same as flooding occurring after placental delivery.

The removal of the placenta is not, as a general thing, a difficult operation; sometimes, however, it may form a partial or complete morbid adhesion to the uterine parietes, when it must be detached according to the mode explained when treating of morbid placental adhesion. In all cases, after having removed the placenta, it should be carefully examined to ascertain whether any portion of it is left within the uterus, and if any considerable part of it be wanting, say, one-fourth, or one-third, the hand should be immediately re-introduced, to remove the disrupted part, provided the uterus has not in the meantime contracted around it.

It may be necessary to again advert to a rule which should not be disregarded; which is, that if the hemorrhage has been very great, causing excessive debility and syncope, an attempt at removing the placenta must not be made until the patient rallies a little; for if, during the state of syncope the flooding ceases, the introduction of the hand, by removing the clot formed, would cause a return of the discharge followed by almost certain death.

In this, as in all puerperal floodings, the patient must not be left too soon, the medical attendant should remain with her an hour or two after the arrest of the discharge, for the purpose of knowing that the contraction of the uterus is permanent, and that there will be but little danger of a return of the flow; and on leaving the house, he should, previously, give full instructions to the nurse, or some friend, how to proceed, in case of a return of the flooding. Measures should also be adopted to guard against an attack of inflammation.

The FOURTH VARIETY of uterine hemorrhage, is that which appears after the extrusion of the secundines; this may be external and apparent, or it may be internal and concealed. It is an extremely dangerous form of flooding, often manifests itself suddenly and unexpectedly, and is frequently very difficult to subdue. It is commonly owing to inertia, or want of contractions of the uterus, or perhaps the contractions may be irregular and unequal; occasionally, it may be the result of rupture of the cervix, and will be severe and dangerous, in proportion to the extent of the rupture. A certain quantity of blood always escapes from the mouths of the uterine vessels, after delivery, without causing any alarming or serious consequences, especially, when the uterine tumor is found hard and firmly contracted; but when the system experiences the effects of the loss of blood, and the uterus is found soft, flabby, and uncontracted, the patient becomes exposed to great hazard. Among the causes which may induce inertia of the uterus, may be named, mental excitement, debility of the muscular fibers of the uterus after a labor aided by Ergot, high temperature of the room, reaction from the use of stimulants, a clot filling up the os uteri, constitutional or local incapability of muscular contraction, neglect of the bandage, meddlesome interference, etc., etc.

The hemorrhage may come on immediately after the expulsion of the secundines, even when the labor has been thus far favorable and without any untoward accidents; or, it may not appear for half an hour, or an hour after the delivery; and, sometimes, several hours or even days may intervene before the effusion is manifested. Usually, after the first gush of blood, the patient faints, and the discharge becomes lessened or suspended; she rallies, the effusion returns, is again succeeded by fainting and a suspension of the flow, and in this manner the rallying, flooding, and fainting alternate, until the system has become so exhausted that reaction is impossible, and death terminates the scene. Sometimes, the discharge will take place slowly, continuing for some time before the patient becomes completely lost in a fatal syncope. Again, the first gush is, occasionally, so great as to produce excessive prostration of the system, with syncope, from which the patient never rallies. The influence of the discharge upon the system, varies with different women; some may have but an inconsiderable degree of depression from an excessive flow, while others will be destroyed by the loss of from twelve to eighteen ounces. And the hemorrhage is not to be dreaded, therefore, so much from its quantity, as from its effects upon the constitution.

SYMPTOMS.—This form of hemorrhage usually comes on
presenting the symptoms common to copious effusions of blood.
the first intimation the physician has of the danger, is an ex
the patient of excessive faintness: her countenance
breathing difficult and hurried, the extremities cold, wit
ration on the face and forehead, and the pulse rapidl
quick, feeble, fluttering, indistinct, and perhaps.

a few beats, accompanied with a state of unconsciousness, which often comes on in a few seconds. On examining the bed and napkins, a large quantity of blood will be found, perhaps so excessive as to find its way from the bed to the floor; or there may be a very small discharge externally, but a copious one internally.

If the first gush should not prove fatal, after a greater or less duration of the syncope, the pulse returns, gradually increasing in strength, the countenance becomes a little more florid, the extremities warmer, the breathing more natural, and the patient recovers her consciousness. If the system has been considerably depressed by the discharge, she now manifests much restlessness and uneasiness, throwing her arms about, gasping and crying for fresh air, to be fanned, etc., with anxious expressions and apprehensions of dying.

After the first rally, in a short time she sinks again under a return of the hemorrhage, from which she may again recover, and so alternate for several times in succession, until finally she complains of a tightness of the chest, a sense of suffocation, which may be followed by a few spasmodic struggles or convulsions, terminating in death. The fluttering, indistinct pulse, the pallid countenance, the hurried respiration, the intolerable restlessness, with rigors and vomiting, are indications of excessive depression of the physical powers, requiring prompt, energetic, and decisive measures, which must be perseveringly persisted in until the patient either recovers, or sinks beyond mortal aid.

The hand being placed upon the abdomen, will, in case of internal hemorrhage, find the uterus soft and fluctuating, and of a size nearly equaling that previous to the delivery; and if pressure be made upon it, a gurgling sound will be heard, accompanied with a gush of blood, fluid or coagulated, from the vulva. When the flooding is external, an examination of the bed and napkins will give some idea of the copiousness of the discharge; and although the uterus will be found soft and flabby, it will not be so large as in the former case.

In these hemorrhages after delivery, the accoucheur should always ascertain two things: first, that the whole of the placenta has been abstracted, for a small portion retained within the uterus has frequently given rise to copious flooding; and when called in to a case as consulting or assisting physician, he should never forget to ask for the placenta, that he may examine it carefully: this should never be omitted, even though the attending physician should insist that it had been completely removed; for cases have occurred in which such assertions have been found erroneous—not intentionally, but from an insufficient or hasty attention to the matter. Secondly, ascertain that the uterus is not inverted, a condition which may be readily effected by traction upon the cord, or drawing down of the placenta, when the organ is in a relaxed and paralyzed condition; and the mode of ascertaining this will be explained under the head of *Inverted Uterus.*

TREATMENT.—The flooding which occurs at the parturient period is not owing to any increased or inordinate action of the heart and arteries, and is, therefore, a passive hemorrhage, being caused solely by the exposure and patulous condition of the orifices of the uterine blood-vessels, the result of placental separation and non-contraction of the uterus. The indications of treatment are, to arouse the contractions of the uterus, by which alone can we expect to suppress or check the hemorrhage, and to support the strength of the patient.

If, upon an examination, it be ascertained that a considerable portion of the placenta has been left within the uterine cavity, the hand must be immediately introduced, as heretofore stated, for the purpose of removing it; and, usually, the uterus will contract as soon as the removal is effected, thereby arresting any further flooding.

But the placenta may have been entirely removed, and still a profuse hemorrhage be present: the woman's safety, then, depends entirely upon the induction of uterine contraction. The practitioner must proceed calmly, steadily, and energetically: a hesitation, a falter, a timidity, and above all, an inexcusable ignorance of his duties, are almost certain death to his patient. Everything around is calculated to unman him, if he has not previously instructed and prepared himself; the appalling discharge of blood—the sudden pallor of countenance, depression of pulse, and loss of consciousness—the intolerable and significant restlessness, gaspings for air, and heart-rending exclamations of anticipated death—together with the alarm, the agonizing anxiety, and hurried whisperings and questionings of friends, are but little conducive to assist him in tranquilizing his mind. But notwithstanding all these, he *must be* composed, positive, prompt, and firm—*must* subdue all his own feelings, for the safety of his patient; and without he is able to do all these, he is unfit for the responsible duties of an accoucheur.

The hand of the practitioner must be placed upon the abdomen of his patient, for the purpose of making firm and constant pressure over the fundus uteri, and the pressure may require to be continued for two or three hours, in which case an assistant may relieve the medical attendant by performing this manipulation, and which will always be found superior to a bandage: not only should the fundus be compressed, but it should be grasped, squeezed, or kneaded by the hand, which will tend to arouse its contractions, as well as to prevent it from becoming filled and distended with blood and clots; and this should be continued, notwithstanding the patient may desire us to desist on account of the pain produced. The pressure or kneadings should never be so powerful as to indent, or cause a partial or complete inversion of the uterus. When the flooding has been arrested, a bandage and compress over the fundus may then be substituted. In conjunction with the pressure, cold applications should be applied to the pelvis; thus, cold water, or a mixture of cold water and vinegar should be poured upon the naked abdomen from a considerable hight; and napkins may be dipped in the same, and then applied suddenly to the vulva, the thighs and nates. And this treatment should be persevered in until the shock or succession of shocks arouses uterine action. LIGATURES should be applied around the thighs, in all cases, as early as possible. When the system becomes considerably depressed, some care will be required in the resort to the above cold applications, as their constant use, at this time, will be apt to cause injurious rather than beneficial results.

Injections of Cold Water into the vagina, uterus, and rectum, have all been advised, but I have never employed them: should I deem such means requisite at any time, I think I would prefer injecting a cold solution of Borax into the rectum, on account of its well-known influence on the contractile powers of the uterus, even when used in this manner.

Internally, Ergot is indicated, but it will frequently fail in effecting any beneficial result. I place great confidence in the exhibition of tincture of Cinnamon, which undoubtedly exerts an influence upon the uterus: it may be given in teaspoonful doses, in some sweetened water, and repeated every ten, thirty, or sixty minutes, according to the urgency of the case; or it may be beneficially combined with other agents, thus:—Take of tincture of Cinnamon, tincture of Rhatany, oil of Turpentine, each, equal parts: mix together, and give from half a fluidrachm to a fluidrachm for a dose, in some convenient vehicle, and repeat as may be required. Or it may be combined with Tannic Acid, tincture of Ergot, and Port Wine; or with tincture of Catechu, oil of Erigeron, or oil of Senecio Hieracifolius. But it must be recollected, that however valuable they may be in other cases, astringents are of but little value in these floodings, unless the contraction of the uterus is effected, and then they are not required. It is only in instances of moderate flooding where these agents are apparently beneficial.

The tincture of the inner bark of the Cotton root, prepared with the spirit of Nitric Ether, has been found, in the practice of Prof. C. H. Cleaveland, myself, and several others, very successful in menorrhagia, almost amounting to a specific; and this fact, in connection with a knowledge of its abortive action, has led me to try the following mixture in a few recent cases of uterine hemorrhage, and apparently with most decided success: Take of the tincture of inner bark of Cotton root, tincture of Ergot, and tincture of Cinnamon, each, equal parts; mix together. Dose, from half a fluidrachm to a fluidrachm, in Port wine, or other convenient vehicle, as often as required.

The Calcined Deer's Horn (*See Am. Eclectic Dispensatory, page* 401), has been highly recommended in uterine hemorrhage, having always succeeded in arresting the discharge, when other means have failed. I have not employed it in practice, having succeeded in these cases by the means above described. Yet its positive influence in checking hemorrhage, has been frequently named to me, by physicians who have used it, and whose statements are entitled to confidence; beside, I know of instances where it has been exhibited with success. It is generally administered in drachm doses, repeated every ten, twenty, or thirty minutes; each dose may be added to about a gill of hot water. This preparation is considered a powerful styptic, from the facility with which hemorrhages are checked by its internal use; yet, from its beneficial results in menorrhagia and uterine hemorrhage, it must undoubtedly exert a decided influence upon the uterus itself, independent of any styptic power it may possess. It would be well for practitioners to ascertain whether it possesses any power over the contractility of the muscular fibers, of the uterus, in instances where the pains of labor are weak or inefficient. Equal parts of calcined Deer's Horn, compound powder of Ipecacuanha and Opium, and Capsicum, mixed together, is a common preparation with many physicians in uterine hemorrhage of moderate severity, the dose being from five to ten grains, as often as circumstances indicate; and many are in the habit of giving a dose immediately after the birth of the placenta, supposing that it prevents a tendency to flooding.

Other agents have been advised, but I am not acquainted with any especial value they possess, for instance—a mixture of three parts of Alum, two of Capsicum, and one of Geranium, in doses of twenty grains every ten, twenty, or thirty minutes. Likewise, doses of Tannic Acid five grains mixed with half a grain or a grain of Opium, and repeated according to indications. It makes, however, but little matter what remedies be used, so that the most important indication be fulfilled—energetic and permanent uterine contractions.

Prof. Meigs recommends the following course, in obstinate cases: "If the student should find the hemorrhage not to be stayed by his treatment, let him press his fingers, gathered into a cone, firmly down upon the aorta, near the umbilicus. If the patient should not be troubled with extraordinary obesity, he will be able to feel the throb of the aorta with the points of the fingers. Let him compress the tube according to his judgment, in such a way as to check the downward rush of the torrent. This will operate usefully in two ways—first, by lessening the force with which the blood reaches the bleeding orifices, which will then have an opportunity to close themselves, more or less completely; and second, by causing a greater determination of blood to the encephalon, whereby the tendency to deliquium, will be lessened. Many lives have apparently been saved by thus compressing the aorta." I have never tested this method, having generally succeeded in checking the hemorrhage by the means above named, yet I have no doubt of its efficacy in many cases, and can bring to mind instances in which it might have been the means of saving several valuable lives; however, I should not hesitate to adopt it when other means proved ineffectual, and would favorably recommend it to the attention of the student. Baudelocque, I think, advised a somewhat similar course.

The introduction of the hand within the uterine cavity, in hemorrhage after the delivery of the placenta, for the purpose of stimulating the uterus to act, by making pressure and frictions upon its inner walls, should never be attempted; but, it may frequently be necessary to introduce it for the removal of the coagula, which sometimes adhere so strongly to the inner uterine membrane as to oppose all natural efforts at expulsion, and by their presence, keep up a greater or less amount of flooding, even though contractions may have been induced. On this point, however, there is much diversity of opinion.

The coagulum formed within the uterine cavity, may usually be considered a means adopted by nature to check the flooding, as well as to eventually stimulate the organ to contraction. In many instances, the introduction of the hand, with frictions internally and externally, and aided by Ergot, fail to arouse the activity of the uterus; it continues soft and flabby, and if the coagula are removed with the womb in this inert condition, it may be followed by a fatal increase of the hemorrhage. The safety of the woman, in such case, depends entirely upon the presence of the coagula, and its continuance until contractions are excited, when they will, as a general rule, be expelled without artificial aid. Again: should the uterus be suddenly aroused, as has been the case, and contract upon the hand within its cavity, the position of the accoucheur, as well as of his patient, will be, at least for a time, anything but agreeable—the hand being fastened within a firmly contracted womb. An artificial removal of the clots may, however, be advisable where there has been a failure of the other means employed, with considerable distension of the uterus, and symptoms indicative of a flow internally; here, the removal of the coagula, followed by active means to secure uterine contraction, may prove serviceable, but it should be undertaken with cautiousness and prudence, because, if we fail to induce the desired contractions, the consequences to the patient become more serious. A removal of the coagula may likewise be attempted in cases where the uterus is small, with contractions or a disposition to become firm, but where, notwithstanding, the flow of blood continues in great quantity: in these cases the clots are usually so firmly agglutinated to the inner walls of the uterus, that the efforts of the organ can not expel them. Any great accumulation of coagula, however, will not be apt to take place, if strong pressure or kneading be applied over the fundus uteri by the hand, or by a properly adjusted compress and bandage: it is the neglect of this measure which frequently occasions the difficulty. When the external hemorrhage has not been great, but the constitutional symptoms indicate a loss of much blood, and there is but little distension of the uterus, an examination may find the *vagina* filled with a coagulum, and this should be at once removed.

Dr. Rigby speaks favorably of applying the child to the mother's breast, in this variety of flooding; suckling frequently induces after-pains, and from the sympathy existing between the uterus and mammæ, it may be found an efficacious method of causing the uterus to contract: if the plan be tried, the mother should not be moved or disturbed in her position. Galvanism has been recommended by Dr. Radford, and there is no doubt but it will prove successful in many instances.

An important point, to which I have heretofore adverted, is, not to interfere when *syncope* is present. Any depression of vascular action is favorable to coagulation of the blood, and we most commonly find a cessation of the discharge while the patient lies in this condition; and an attempt, at this time, to introduce the hand within the uterus, or inject fluids into its cavity, may, by removing the clots formed, occasion a fatal renewal of the hemorrhage. Neither should stimulants be given unless absolutely required, because the sudden increase in arterial action occasioned by their exhibition may not only prevent a coagulum from forming, but may also remove that which has already been deposited over the orifices of the bleeding vessels—of course, increasing the dangers of the hemorrhage.

Indeed, stimulants are only to be administered when the system has become considerably depressed, and when there is reason to fear that the syncope would prove mortal: then the vascular action must be sustained and the vital energies aroused, as an indispensable measure. Brandy, rum, ether, ammonia, capsicum, etc., may be given, as heretofore recommended in hemorrhage from placenta prævia. At this time, it will be extremely improper to continue the local applications of cold, as their influence will be to augment the depression of the system.

Some writers have advised the employment of the tampon, but it is bad practice. The danger of giving rise to a concealed hemorrhage should always deter us from using the tampon in uterine hemorrhage occurring, especially at the parturient period, unless, indeed, we except the instances of placenta prævia referred to on page 435.

In cases of excessive prostration, *transfusion* has been advised. I have no knowledge of its effects from my own experience, but the recorded instances with which I have become acquainted have not given me any exalted opinion of it.

The AFTER-TREATMENT OF HEMORRHAGE, requires some attention; for although the discharge may be arrested, and the uterus contracted, yet there may be a return of relaxation of the uterine muscular fibers, with an accompanying flow; hence, many hours may pass before the patient will be entirely free from this danger. As soon as the flooding has been arrested by the means employed for that purpose, a bandage should be firmly applied around the body, so as to secure a steady compression over the fundus uteri: a thick compress placed between the abdomen and the bandage, will materially aid in accomplishing the desired object, viz: to prevent the occurrence of any relaxation of the uterine fibers. The bandage should be examined every hour or two, to ascertain that it has not moved, but remains in its proper situation: it frequently happens, that when the bandage becomes loosened, or disturbed from its proper position, there will be a return of the hemorrhage, and of the relaxed condition of the uterus. The ligatures which were applied around the thighs may be loosened, but they should not be removed, at least, until a sufficient time has elapsed to guarantee the safety of the woman from further hemorrhage. Upon no account whatever must she be allowed to move for some hours, proportioned to the severity of the attack. In a moderate flow, she may be "put to bed" carefully, and her linen changed, in the course of five or six hours after its cessation; but in profuse and exhausting attacks, twelve or eighteen hours may elapse before it will be proper to attempt her removal. Sudden death has frequently occurred by raising the patient in a sitting posture, for any purpose; and even a mere change of position from one side of the bed to the other, has resulted fatally.

The practitioner will, therefore, see the absolute necessity for strictly enjoining a state of quiescence for a sufficient length of time. It is always better to keep the head somewhat lower than the body. As it would be imprudent to allow the patient to lie in the damp and moisture around her for any length of time, means must be adopted to render her comfortable and dry, without moving her in the least, or allowing her position to be changed. A blanket, or something of the sort, may be slowly and carefully insinuated beneath her, in such a manner as to effect the desired result.

To favor a state of rest, as well as to moderate any irritability of the system, the compound powder of Ipecacuanha and Opium may be administered in a dose of eight or ten grains, to which three or four grains of Capsicum may be added. Or, a powder composed of Capsicum five grains, Ipecacuanha one grain, Opium half a grain, may be administered every hour or two, as indicated: the addition of Capsicum to these preparations has an undoubted tendency to prevent a return of the hemorrhage, in the majority of cases. The apartment in which the female lies should be well ventilated, darkened, and the temperature must not be too elevated. If much exhaustion is present, cold, nourishing, and easily-digested fluids may be given at short and regular periods, as gruel, beef-tea, etc.; and when the prostration is excessive, some stimulant may be added. Visitors must positively be forbidden: no one is required to be in the room, save the physician, nurse, and husband. Talking, or mental excitement, whether pleasurable or not, is very apt to induce a return of the flow.

In cases where the hemorrhage has not been profuse, the practitioner should not leave the patient for two or three hours; but in the more copious and exhausting discharges, the female is not thoroughly safe until five or six hours have elapsed since their arrest; and she should not be left, in these instances, until this period has passed by. A careful and conscientious accoucheur will never leave his patient at too early a period, but will remain and watch her closely. If the pulse be quick, compressible, and jerking, indicative of hemorrhage, he will be on his guard, and prepared to meet it on its first appearance.

Where females are liable to attacks of hemorrhage after the expulsion of the child, or placenta, it may frequently be prevented by the use of some uterine tonic during the last three or four months of utero-gestation; as for instance, the compound syrup of Partridgeberry, Caulophyllin, Aletridin, etc. And at the time of labor, the os uteri being dilatable, the membranes may be ruptured at an early period, when the presentation is natural; and as soon as the child is born, the bandage and compress over the fundus uteri should be firmly applied.

In cases of excessive hemorrhage, and after the patient has fully recovered from the syncope, a powerful *reaction* usually ensues, accompanied with a greater or less degree of nervous irritability. The velocity of the circulation becomes increased in proportion to the decrease which the blood has experienced, its momentum probably atoning for the deficiency in quantity. Fever is commonly present when this reaction occurs.

There will be throbbing of the temples, a distressing pain in the head, vertigo, ringing in the ears, and an intolerance of noise, and occasionally of light. In nearly every case pain in the head will be complained of, accompanied with a sensation or noise, which may be variously compared to the beating of a small hammer within the skull, the ticking of a clock, the singing of a teakettle, or the roaring of the sea, and which is probably owing to the forcible contraction of the arteries upon the diminished amount of blood contained in them, propelling it onward by jerks. The pulse will be quick, small, jerking, and wiry or compressible; the least motion causes great disquietude; there will be a sense of faintness and of impending dissolution, especially on being raised from the pillow. The skin becomes hot and dry, the mouth dry and parched, and the features are shriveled, with a contracted state of the lips and nose. Palpitations or fluttering of the heart are often present, as well as panting, sighing, moaning, dyspnœa, and sometimes a hacking, irritating cough. Fresh air or the smelling-bottle will frequently be called for. On awaking from sleep, or on being suddenly disturbed, the patient will exhibit a degree of hurry and alarm. Sometimes there will be retching, or vomiting, hiccough, and a dislike for solid food. All the secretions become lessened, the bowels are flatulent, and constipation or diarrhea may be present. Wakefulness is not uncommon. Various organs, as the peritoneum, pleura, or brain, may present symptoms of inflammation; and upon arising or assuming the erect position, death may suddenly occur.

These symptoms will, of course, vary, both in kind and degree, in different females, depending on the extent of prostration and other concomitant circumstances; but the peculiar pain and noise in the head will very rarely be absent.

TREATMENT.—The above disagreeable conditions are dependent on a diminution of the quantity of blood in the system, and the indications will be, to increase the amount of blood, to impart tone and vigor to the constitution, and to remove the various unpleasant symptoms with which the patient is annoyed.

To fulfill the first and second indications, it will be necessary to allow the patient nutritious and easily-digested articles of diet, as boiled milk, arrowroot, calf's-foot jelly, beef, mutton, and chicken broths, oyster soup, custard, soft boiled eggs, Indian meal gruel, etc. If required, wine or brandy may be added to the diet, and even ale or porter is admissible in some cases; but all stimuli should be allowed with much caution. The nourishment should be given at regular periods, and in small quantities, so as not to oppress or offend the stomach.

For the removal of annoying symptoms several means may be required. Thus, the heat and dryness of the surface may be relieved by sponging the head, body, and limbs with cold or tepid water, or vinegar, as circumstances will indicate: the compound powder of Ipecacuanha and Opium will likewise assist in the accomplishment of this result, as well as to allay nervous irritability and relieve the distress in the head; and the patient should be kept in a cool and well-ventilated room, and in a state of perfect quiet and rest. Where Opium or its salts of Morphia disagree, other agents may be advantageously exhibited, as Hyoscyamus, Scutellarin, or infusions of Cypripedium, Ictodes, Scutellaria, etc. A pill composed of equal parts of Scutellarin, Lupulin, and Cypripedin, will be found beneficial: it may be made into three-grain pills, and one or two administered every hour or two. The tinctures of Hyoscyamus and Aconite-root will frequently afford much relief in allaying pain and nervous irritation. As little medicine as possible should be employed in these cases; the greatest reliance must be placed upon fresh air, quiet, and nourishment.

Constipation may be treated by Seidlitz powders; by the mixture of Rhubarb two parts, and Bicarbonate of Potassa one part, heretofore referred to on page 137; or by rectal injections. But in all instances active medication of any kind must be positively avoided. The distress in the head, quick pulse, fever, constipation, etc., may lead the young accoucheur to suppose that relief will be obtained by an active purge, which, if administered, may prove injurious to his patient. The difficulty, as before remarked, is due to the loss of blood, and not to any determination of this fluid to the brain or other organ; and so soon as the bloodvessels become filled with the necessary amount of their proper fluid, all the symptoms will disappear. However, should the face, instead of the usual pale appearance, become tumid and slightly florid, from an excess of blood in the veins, warm applications may be applied to the feet and limbs, with cold to the face and head, for the purpose of equalizing the circulation.

The patient must not be allowed to get up, for any purpose whatever, until all the above-described symptoms have disappeared; and when this *is* attempted, care must be taken that it be effected slowly, and that at first the sittings be for a very short period only. And should the sitting posture occasion a sensation of faintness, it must be dispensed with, and not tried again for a few days. Too much attention can not be paid to this point.

CHAPTER XXXVIII.

COMPLICATED LABOR—RETENTION OF THE PLACENTA—HOUR-GLASS CONTRACTION—MORBID ADHESION OF THE PLACENTA—PUTREFACTIVE ABSORPTION.

In primiparæ, the placenta, in the greater number of instances, immediately follows the expulsion of the child, and with others it usually comes away in from five to twenty minutes thereafter; but cases frequently occur in which it remains for hours, or even days, if permitted, before it will pass off; and whenever it is not expelled within an hour after the birth of the child, it is called a *retained placenta.*

Young accoucheurs frequently mistake a delayed appearance of the placenta for a retention; thus, the mass may be detached and lie loosely within the cavity of the uterus, or within the upper part of the vagina, or partly within each, and not advancing any further, may be erroneously considered a retention; whereas, some simple expedient, as firmly grasping the fundus uteri, blowing in the hand or in a bottle, sneezing, coughing, bearing down, or artificially producing retching, will at once liberate it. Ordinarily, the last uterine pains which effect the delivery of the child, either completely or partially detach the placenta, and the mass will remain within the cavity of the organ until expelled by a return of its contractions. When the detachment is partial, or even when complete, dangerous hemorrhage may ensue, especially when the uterus is in a state of inertia. If, however, no detachment has taken place, and the placenta is entirely adherent to the uterus, there will be no immediate danger from flooding.

The placenta may be retained without accompanying hemorrhage, and instances are recorded where it has remained within the uterus for several days without causing any bad effects: cases have likewise been met with where it never left the uterus, having been, probably, absorbed by the uterine vessels. Several authors have counseled us not to extract the placenta at all, unless hemorrhage be present, but leave it entirely to the natural powers; it has, however, been found by experience that, more commonly, an attention to this advice is fraught with danger to the female, who becomes thereby exposed to hemorrhage, uterine inflammation, or constitutional irritation from absorption of putrid animal matter, as marked by vomiting, purging, and typhoid symptoms. Severe after-pains frequently accompany a retained placenta, but while these exist, they are useful, being evidences of the contractions of the uterus; still, the female often suffers unnecessarily from them, by not having the after-birth expelled.

An accoucheur should never leave his patient with the placenta undelivered, because she is not safe while it remains within the uterine cavity; beside, any uncommon delay will give rise to mental excitement and anxiety, from an apprehension on her part that he is not thoroughly versed in his profession, or else that there is some great danger present. Her friends will likewise be very apt to increase her agitation and fears by whispered suggestions of a similar character. And in case of a retention, he should remain for an hour or two with her after the cake has been extracted, to guard against subsequent hemorrhage.

In 259,250 cases, retention of the placenta occurred 392 times, or about 1 in 661¼; in 186 cases, 36 died, or about 1 in 5; the immediate cause of the fatality being hemorrhage.—(*Churchill.*) Three causes have been assigned for this difficulty:—1, inertia of the uterus, or want of uterine contraction; 2, spasmodic or irregular contraction of the uterus; and 3, morbid adhesion of the placenta to the uterus. These causes and their treatment will be considered separately.

1. RETENTION OF THE PLACENTA, FROM INERTIA OF THE UTERUS, more frequently occurs after a difficult, protracted labor; though it may be due to a large pelvis, in which the uterus is allowed to suddenly evacuate its contents—but, in the latter instance, hemorrhage is apt to ensue, before the organ can sufficiently recover, from its abrupt disgorgement, to contract.

Upon placing the hand on the abdomen, the uterus, instead of being firm, hard, and well defined, indications of its normal contraction, will be found large, soft, and flabby, scarcely distinguishable, through the abdominal parietes, from the other viscera in the hypogastrium; there will be no pains, or, if they do occur, they will be very feeble and indistinct.

TREATMENT.—Retention of the placenta, with accompanying hemorrhage, has already been considered; those cases will now be referred to, in which flooding is absent.

The principal indication is, to adopt measures to induce uterine contraction. For this purpose, frictions and firm pressure with the palm of the hand over the fundus uteri, and at the same time gentle tractions upon the umbilical cord in the direction of the axis of the superior strait, should be made. In compressing the uterine globe, *in all cases* where it is in a soft and flabby condition, much care should be taken not to indent the organ, lest an inversion of it be effected—for in a relaxed state, it will be an easy matter for a careless or ignorant person to cause such a depression by exerting an unnecessary amount of pressure. Again, in making tractions upon the cord, too much force must be avoided, else, it may be torn from the placenta: or the placenta may be forced from its uterine attachment, giving rise to profuse and dangerous flooding; or the uterus may be either prolapsed, or inverted. Slight tractions upon the cord, to solicit or arouse the uterus to action, are allowable; but no attempts to draw out the placenta by it should *ever be made* while the uterus is in a relaxed condition; any effort of this kind should only be attempted when the organ is contracted, and then, the amount of force employed should be moderate. Frequently, the sudden application to the abdomen of a napkin wet with cold water, or, a sprinkling of cold water upon the abdomen and thighs, will excite the uterus to action.

So also will coughing, blowing, sneezing, etc; or retching may be produced by titillating the throat and fauces with a feather. If these do not answer, Ergot may be administered; a drachm of the coarsely powdered drug to be added to a teacupful of boiling water, of which, a tablespoonful should be given as a dose, repeating it every ten or twenty minutes, until contractions are induced. Cimicifuga, Caulophyllum, or their concentrated preparations, will frequently prove more advantageous than the ergot; the inner bark of the Cotton root has been recommended, but I have never used it in these cases. After a certain time, should the above means prove unsuccessful, it will then become necessary to pass up the hand and extract the placenta. The time necessary to elapse before attempting this manual operation, is generally stated at an hour, or an hour and a half; yet, there can be no positive rule to guide us; for instance, when the labor has been very tedious and severe, the uterus being sluggish and inactive, without hemorrhage, the operation may be safely delayed for even a longer period; and in many instances of this kind, it will be found that the placenta has been remaining nearly all the time in the upper part of the vagina. It must be remembered, however, that the sooner after delivery the more easily can the hand be introduced into the uterine cavity, as the parts will be in a more relaxed condition; and the manipulation should never be delayed until the parts have so far recovered their original firmness, as to render the entrance of the hand painful and difficult. One hour and a half, under ordinary circumstances, or three hours, in cases of extremely tedious labor, may, perhaps, be considered the limits; although I have in two instances, readily introduced the hand within the vaginal and uterine cavities, and safely removed the placenta, seven hours after the birth of the child; in each case the labor having been very protracted. The mode of removing the placenta, has already been described under the treatment of Hemorrhage during its retention.

Be extremely careful never to withdraw the hand from the cavity of the uterus, holding the placenta, without first having induced contractions of the organ; and should these not occur, after the placenta has been detached, the hand must be kept in the uterus, until they have been excited by some of the various methods already recommended. And after the mass has been abstracted, it should be carefully examined to ascertain that no portion of it has been left behind. The prudent introduction of the hand into the womb for the abstraction of the placenta, is always safer than the attempt by forcible traction upon the cord. As soon as the placental mass has been delivered, do not fail to secure the permanency of the uterine contractions, by the application of the bandage, and if necessary, a compress.

Dr. Murphy, in his Lectures on Parturition, observes: "*Retention of the placenta* may arise from different causes. Sometimes the sphincter of the vagina closes upon it, and the placenta is thus retained until re. moved by the hand, or by firm pressure on the fundus of the uterus. In other instances, the *placenta remains in the uterus* after the delivery of the child, until it is expelled by its subsequent contractions, rendered efficient by similar contractions of the diaphragm and abdominal muscles. This additional aid is required, inasmuch as the action of the uterus alone is not sufficient for the purpose. Hence, when the abdominal muscles are feeble, so that the uterus can derive no support from them, the *placenta is retained in this cavity*. This cause of retention has been generally mistaken for *inertia* of the uterus; and, under this impression the placenta has been, very unnecessarily, withdrawn from the uterine cavity. ° ° ° When the child leaves the uterus, a very powerful stimulus to its action is removed; and this stimulus the placenta is quite inadequate to supply. The uterus, therefore, first ceases to act for a certain time, and when the action is renewed, it is weak, and continues only for a short time. If the uterus fails in discharging the placenta by a few of these efforts, it becomes accustomed, as it were, to its presence, and it no longer acts as a stimulus, but remains with the uterus imperfectly contracted around it. A very efficient means of supplying this want of irritation to the uterus, is the pressure of the abdominal viscera which surround it. When the abdominal muscles are strong, they contract upon the retiring uterus, compressing the intestines, and consequently the uterus, on all sides. These weak pains, therefore, are greatly assisted and rendered effectual by the straining efforts of the patient acting as a stimulus to the uterus from without. But the abdominal muscles are not always strong; on the contrary, in most instances, they are extremely weak, in consequence of our civilized habits. They are too often reduced almost to a state of atony from the constant pressure of the corset; hence it follows that the uterus derives little or no support from them, and the placenta is retained, not from any want of power in the uterus to expel it, but from a want of sufficient stimulus to cause the uterus to contract. There is no *inertia* of the uterus, but only a suspension of its action. It is for this reason, and to supply this deficiency that the pressure of the hand on the fundus of the uterus, during the expulsion of the child, is found so useful; and, on the same principle, the application of a bandage round the abdomen, is always necessary, in order to give it proper support."

2. IRREGULAR CONTRACTION OF THE UTERUS, termed *Hour-glass Contraction*, sometimes accompanies retained placenta. It may affect any part of the uterus, but is more commonly met with at the os uteri. True hour-glass contraction is a strictured condition of the central portion of the organ, dividing it into two chambers, an upper one, which usually contains the placenta, and a lower one; it is rarely met with in practice. (*Fig.* 62.)

Sometimes the uterus contracts longitudinally upon the placenta, having the shape of a cylinder, or sugar-loaf; sometimes, there will be a contraction of only one corner; at others it contracts upon the placenta in a globular form; again, the constriction at the center, forming the true hour-glass contraction, may be met with. The placenta may be completely inclosed above the strictured part, or only partially, part of it being in the cavity above the contracted portion of the uterus, and the remainder passing through the narrowed section into the cavity below. The placenta in these cases, may be wholly or partially adherent, or it may be detached.

FIG. 62.

HOURGLASS CONTRACTION OF THE WOMB.

Prof. Meigs, believes the placenta to be always adherent in hour-glass contraction; Dr. Douglass of Dublin, thinks it almost invariably occurs with morbid placental adhesion; so likewise does Dr. F. H. Ramsbotham, and in the cases which I have met with, I have found placental adhesion to a greater or less extent in each of them.

This irregular contraction of the uterus may exist in the longitudinal fibers, or in the transverse, and more generally occurs after a rapid delivery by violent and forcible pains. It may, however, follow a protracted or preternatural labor, or a delivery of the child effected by Ergot, and sometimes happens as the result of an over-distended uterus. Not unfrequently an improper interference with the cord, making traction in the wrong direction, and by jerks, instead of a careful, continuous pull, will irritate the os uteri and cause the womb to contract irregularly; pressure and friction immediately over the pubes instead of over the fundus uteri, has also occasioned the difficulty.

Hemorrhage may, or may not be present; and when it does exist it is generally less profuse and alarming than when there is a complete state of uterine inertia, so that less haste will be required for the extraction of the placenta; this, however, will be found a more difficult and dangerous operation, than in retained after-birth without irregular or spasmodic contraction.

DIAGNOSIS.—Most instances of irregular uterine contraction are impossible to detect by external examination. Generally, the delivery of the child is followed by several severe and strong pains, without any descent of the placenta, and which symptom, in connection with a hard and enlarged condition of the uterus, when felt through the abdominal parietes, and a full and turgid state of the umbilical cord, may lead to a suspicion of the difficulty.

Should the uterus contract in the cylindrical form, it may be detected through the abdomen, the fundus being felt at the epigastrium, and the body conveying to the fingers the sensation of a roll or cylinder.

If it be a true hour-glass contraction, it may likewise be detected by abdominal palpation. The uterus will be found to form two tumors just above the pubis, the larger one of which contains the placenta, while the smaller is joined to the other by a kind of neck, which is the constricted central portion of the uterus.

But the more positive method of ascertaining the difficulty is by an examination per vaginam. Passing the hand along the cord, the *cervix* may be found hard and firmly contracted, resisting the introduction of a finger, while the other hand placed upon the abdomen, will find the uterine globe relaxed, or at all events, less firmly condensed than the cervix. If the constriction is not at this point, the hand must be carefully carried into the uterus, following the cord, when it will, at some point, detect an aperture which leads into the upper chamber, and perhaps, a portion of the placenta may be felt protruding through it. In this case, the lower part of the uterus will be usually soft and flabby, while the portion above the stricture will be harder and firmer. The accoucheur must not mistake this aperture for a rupture of the uterus; for, it must be borne in mind, that while the child escapes through a rupture, the placenta seldom does.

TREATMENT.—This will depend somewhat upon the presence or absence of hemorrhage. If it be present and profuse, the accoucheur will at once attempt the extraction of the placenta, in the manner described hereafter; if it be not very profuse or alarming, he will proceed in his management more slowly and cautiously, being governed, in this respect, by the effects of the loss of blood upon his patient.

Where hemorrhage does not exist, and the placenta does not pass away, within the ordinary period, there is no necessity for haste, unless, indeed, a true hour-glass contraction be ascertained, when interference should be promptly attempted, there being, in such case, but a small chance for the spontaneous expulsion of the placenta.

In all other cases, where there are no additional circumstances present requiring interference, attempts should not be made to remove the placenta artificially, for at least an hour after the birth of the child. The treatment employed in the meantime, should be the same as already recommended in retention from inertia, as constant pressure over the fundus, slight but continued traction upon the cord in the direction of the axis of the superior strait, etc., and which will frequently subdue the spasmodic action, and effect a sudden ejection of the placenta. An hour having passed without indications of an expulsion of the placenta, the manual operation will have to be attempted. Introduce the hand into the vagina in the usual way, and then into the uterus. If the constriction be at the os or cervix, gently and carefully introduce first one finger and then another, until, if necessary, the whole hand has entered; but frequently, the os may be dilated with two fingers, so that the placenta may be seized and slowly worked out—and, sometimes, this dilatation alone will remove the spasm and induce normal contractions, followed by a delivery of the secundines.

If the contracted portion be higher up, the hand being guided by the cord, will have to be passed upward until the constriction is reached, and then, as before, first one finger, and then another must be introduced, gradually and steadily dilating the strictured part as they enter, until the whole hand has been insinuated; then, if the placenta be adherent, it must be carefully and entirely detached, and the hand and secundines suffered to pass out by the uterine contractions only. If the mass be removed before the uterus acts, hemorrhage may come on, hence it is important to induce the action of the organ before withdrawing the hand.

The practitioner must not forget, while attempting the intromission of the hand through the contracted aperture of the uterus, to place his other hand upon the abdomen externally, and press upon the fundus downward, in the direction of the operating hand. If this be neglected, the womb may be so far elevated by the hand within as to render it somewhat difficult, if not impossible, to enter it. Sometimes the hand may be readily passed beyond the contracted part; at others, time, perseverance, and gentleness, will be required before the object can be accomplished.

Occasionally the contraction will be extraordinarily firm, and if dilatation be effected, it will be followed by yet firmer contraction, requiring so much force to enable the fingers or hand to enter, as would be liable to cause laceration if the attempt be imprudently persisted in. Such force must never be employed. If the placenta cannot be removed without violence, let it alone, and pursue the course named under the treatment of Morbid Adhesion. In these cases the uterus is usually in a very irritable condition.

Bleeding has been recommended in these instances, but it is a very objectionable course, as it must not only unnecessarily debilitate the patient, but place her life in a very precarious situation, should a profuse flooding from the uterus follow the relaxation caused by it.

Chloroform has been exhibited in these instances, and I believe with success, though I have had no occasion to employ it, having always succeeded with the compound tincture of Lobelia and Capsicum. Ergot has been advised, but, I think, upon unsafe grounds.

The compound tincture of Lobelia and Capsicum may be exhibited either by mouth, or by injection into the rectum. I prefer the latter mode, which is the one I have used the oftenest and with decided success. The contents of the rectum having been first removed by an enema, the above tincture, in the quantity of three or four fluidrachms, may be at once injected. It usually acts with promptness in overcoming the spasms, when the hand may be introduced, if demanded. If, as may sometimes be required, it becomes necessary to give i [illegible] in by mouth, one or two fluidrachms may be taken. [illegible] case it must not be diluted. It rarely produces sufficient to give apprehensions of hemorrhage: generally, as soon as the spasm has been overcome and the secundines removed, the uterus contracts regularly and permanently. If much relaxation of the system should follow its use, carbonate of Ammonia, Ether, or other stimuli, will speedily effect a beneficial change.

In the exhibition of this tincture per rectum, it will sometimes be found, as I have experienced in my own practice, as well as ascertained in that of others, that an introduction of the hand will not be needed; for as the spasm is subdued, the uterus will act normally, and the placenta will be expelled without any further assistance.

The tincture of Gelseminum has been advised, and I believe successfully used, by some practitioners. I have had no opportunity of testing its value in this difficulty, since its introduction into our materia medica. That it will effect the desired relaxation, will hardly be doubted by any one who has ever used it; but whether the persistency of its relaxing influence can be promptly obviated, and a tendency to flooding thereby lessened or prevented, I am not, from my own knowledge of its use in these cases, prepared to say; although, in the absence of the compound tincture above recommended, I think I should not hesitate to administer it, using at the same time, however, a degree of watchfulness and prudence. (*See page* 315.)

When the placenta is partly within the uterus and partly within the vagina, the os uteri having contracted upon it, no attempts to remove it by forcible pulling should be made, as this would be very apt to tear it: the only method for its removal should be, a gentle dilatation of the os by means of the fingers.

When the placenta has been extracted, examine it carefully, as has been heretofore recommended; and do not forget the necessity for securing a regular, equal, and permanent uterine contractility.

For irregular pains, some practitioners exhibit a mixture of tinctures of Lobelia and Bloodroot, with a few drops of Laudanum. I have not employed it, but should consider it useful in some cases.

3. PLACENTAL RETENTION *from a* MORBID ADHESION *to the* UTERUS, is sometimes met with, and is of a more critical nature than the previous varieties. It may exist in conjunction with irregular con- tion, or with inertia of the uterus, which last renders it more for- able, from the dangerous hemorrhage apt to be present; frequently w minutes decide the question of life or death.

he adhesion may be complete, in which case there will be no flood- until detachment ensues; or it may be partial, and commonly with hemorrhage. The copiousness of the discharge will be in proportion to the extent of detached surface, and the number of vessels exposed.

The cohesive energy existing between the uterus and placenta in these cases, varies considerably; sometimes, the contractions of the uterus are sufficient to detach and expel the mass; at others, the uterus may not be able to cause its separation, which, however, may be readily effected by the hand; again, the cohesion may be so great, as to resist any justifiable attempts to remove it with the hand. And, instances have occurred where, after death, the separation could not be accomplished by maceration, and also where it was impossible to distinguish the line of demarcation between the uterus and placenta when a longitudinal section of these organs had been made.

The causes of morbid placental adhesion are not satisfactorily known. By some authors the difficulty is attributed to a deposition of calcareous or tuberculous matter, from the fact, that these have been found in some portion of the placenta, usually on its maternal surface. Again, it is believed by others, that whenever, from any cause during gestation, an excitement or inflammation of the uterus is produced, it may result in an effusion of lymph, perhaps, forming a new membrane, which more firmly consolidates the utero-placental attachment. But, whatever, may be imagined on this point, it is evident that morbid adhesion occurs altogether independent of the character or management of labor, and is due entirely to abnormal conditions, either of the placenta, or of the uterus, during pregnancy. It is very apt to recur in the same woman, so that when called to attend such cases (when known) the physician should be more prompt in his movements than in ordinary instances.

DIAGNOSIS.—We can know nothing whatever of a morbid adhesion, until the hand is introduced for the purpose of extraction. It may be suspected, however, when several strong pains occur, without any loosening of the placenta; likewise, when the cord, being moderately drawn upon and then suddenly let loose, springs upward with a jerk.

TREATMENT.—When hemorrhage is present, the case must be managed as described under hemorrhage with retention of the placenta. Hemorrhage requires the detachment and removal of the placenta, or the patient will almost certainly die. If no hemorrhage exist, the adhesion, will be, probably, entire.

The early treatment of this difficulty, will be similar to that advised in the preceding varieties—not knowing [illegible] er. This failing, and an hour having elapsed, the [illegible] duced, in the manner heretofore explained, to effect [illegible] ich time the nature of the adhesion will be [illegible] should be removed, if possible, even at the expense of considerable trouble; but, sometimes, its detachment will be impossible.

In these latter cases, there is a diversity of opinion as to the proper course to be pursued, many eminent accoucheurs advise us to remove as much of the placenta as we can, even if it have to be separated in pieces to accomplish this result; while others, recommend us to leave the mass in the uterus, until decomposition has ensued, and then attempt its removal, or if this can not be done, trust to the natural powers, aided by means to overcome the evil results of putrefactive absorption.

When the placenta can be removed without any great violence, it should always be effected; but, if the reverse of this obtains, I think I am warranted by my own experience, in connection with that of many others, in recommending it to be left until decomposition ensues, when a safer opportunity for its extraction may be offered. The tendency to hemorrhage will be less when the whole mass is thus left behind, than when a portion of it has been torn off and removed, the rest remaining adherent. These entire and extremely tenacious adhesions are fortunately quite rare.

In these several instances of retained placenta, no attempts should ever be made to remove it by forcibly pulling upon the cord; neither should the placenta itself, provided a part of it can be seized, be drawn upon, until it has been satisfactorily ascertained that it is perfectly loose, and that no portion of it is retained in a firmly contracted os uteri. Otherwise, an inversion of the uterus may be produced, or, the placenta may be torn, and the remaining adherent portion of it within the uterus, occasion a subsequent hemorrhage.

Should the UMBILICAL CORD BE RUPTURED, then, after a failure of the means heretofore recommended for procuring uterine contractions, the hand must be very carefully and gently introduced within the uterus, the placenta sought for, detached, and removed in the usual manner, being particular to remove it entire, in order to avoid an attack of flooding.

When the placenta is so FIRMLY RETAINED by THE IRREGULAR CONTRACTION OF THE UTERUS, or by MORBID ADHESION, as to resist all legitimate endeavors to remove it, or when portions of it have been permitted to remain in the uterine cavity, the mode of treatment will depend somewhat upon the symptoms which follow.

Generally, severe after-pains are experienced, which interfering with the patient's sleep and quiet, render her very irritable—and these pains are augmented on pressure over the uterine tumor, or when the child is applied to the breast. The discharge from the uterus is at first of a normal amount, and clots are occasionally passed off with it; but in two or three days, its character changes, becoming of a dark brownish color, excessively fetid, and accompanied with pieces of the decomposed placenta. This happens, more especially, when only a portion of the mass is left behind.

Soon after putrescency has commenced, from an absorption of the putrid animal matter, a severe irritative fever attacks the patient, manifesting itself at first by rigors. The pulse becomes small and rapid, the skin, and especially that on the abdomen, becomes hot and dry, pain in the head, of a diversified character comes on—it may be continuous, and accompanied with beating or throbbing, or, it may be intermittent, sharp, and darting. The tongue is at first white, and slimy, or red, shining, and dry; the thirst is inordinate; vomiting is frequently present, or a choking sensation, particularly when the patient endeavors to drink; there is constant restlessness and wakefulness, with mental anxiety, which is plainly depicted upon the countenance. The secretion of milk diminishes; the bowels, at first very torpid, become so excessively loose as to resist the attempts made to check their action. Most usually, erratic pains, of greater or less severity, are present, shooting from one hip to the other, perhaps locating in the neighborhood of the diaphragm and interfering with respiration, or, shifting from one part of the body to another. These symptoms continue to increase, the tongue becomes coated brown or black, the abdomen becomes tumid and tense, the strength rapidly fails, the extremities become cold, vomiting of a dark-brownish granular-like substance occurs, with low delirium, involuntary evacuations of the feces and urine, subsultus tendinum, and in ten or twelve days following delivery, the case terminates fatally.

Ramsbotham states, that "upon dissection, the veins of the uterus are generally found inflamed, and containing pus; the uterus itself, to a greater or less extent, partakes in the inflammatory disposition, and is perhaps gangrenous; or purulent deposits are observed in its substance; and perhaps also in or around some of the larger joints, or among the tendons, or within the fleshy muscles of the limbs."

Sometimes, the placenta is expelled in twelve or twenty-four hours without putrefaction, or any unpleasant consequences; at others, it has been expelled in a putrescent condition, but without causing any irritative fever; and again, in some rare cases [illegible] en discharged nor produced any injury to the general [illegible] upposed by some writers, either been absorbed [illegible], become organized.

A very favorable indication when putrid absorption takes place, is, to observe that the symptoms are less violent, and the discharge of a puriform character, containing portions of the placenta, having but little or no fetor, and accompanied by no great amount of prostration of the vital powers.

TREATMENT.—When it is ascertained that the placenta cannot be removed, a bandage should be applied around the body, in the manner heretofore indicated, with a compress over the fundus, and in two or three days, the attempts to abstract the mass should be cautiously and gently renewed. However, should the pains at any time become very severe and continuous, or the presence of the bandage appear to increase them, it must be removed.

When the placental mass cannot be artificially abstracted, or when portions of it have been left adhering to the inner uterine wall, and, in either case, putrescency occurs, the indications of treatment will be, to subdue inflammation, correct the fetor of the discharge, and support the vital powers: and for the fulfillment of these, various remedies may be used.

When there is hemorrhage, it must be combated by the means already indicated. When the fever is very high, with great irritability of the system, to subdue it, and neutralize to a greater or less extent the influence of the absorbed matter, a mixture of five grains of the compound powder of Ipecacuanha and Opium, with one grain, each, of Sulphate of Quinia, and Baptisin, may be administered for a dose, and repeated every two or three hours. Or, two parts of the compound tincture of Virginia Snakeroot, may be combined with one part, each, of tincture of Gelseminum, and tincture of Wild Indigo, which may be exhibited every few hours in teaspoonful doses. When the influence of these agents is once obtained, by continuing it, together with the other means to combat putrescency, the tendency to vomiting will be considerably lessened. Should there be a great amount of pain, tincture of Aconite root may be used in conjunction with either of the above preparations. The bowels should be kept free by Seidlitz Powders and mucilaginous, laxative injections; and when they become immoderately loose, the tincture of Chloride of Iron may be given in doses of ten or twenty drops in sufficient water, and repeated according to the urgency of the case; at the same time the following injection should be used very frequently, viz: Take of compound tincture of Virginia Snakeroot one fluidrachm, Tannic acid ten or twenty grains, Water half a fluidounce—mix. I have found this course more effectual in restraining the discharges, than any other with which I am acquainted. (*See Putrefactive Absorption*, page 179.)

For a constant drink, during the irritative stage, an infusion of Marshmallow root, or of Elm bark, or either of these with the addition of Peach leaves, or Wild Cherry bark, may be taken freely; lemonade may also be allowed, or tamarind water, prune water, etc., if craved by the patient.

The surface should be frequently bathed with warm water, or an acidulous solution. In some instances a warm saline solution will be found more efficacious.

To overcome the fetor, and aid in removing the loosened putrid portions, a tepid solution of Chloride of Lime, or Chloride of Soda, diluted Pyroligneous Acid, or infusions of Wild Indigo leaf, or bark of the root, or of White Oak bark, or even of brewer's yeast, may be injected into the uterus and vagina several times a day. Too much force must not be applied in introducing the fluids into the uterus, lest they be passed into the canal of the Fallopian tubes. A solution of Borax injected into the uterus has been suggested, but I should hesitate about employing it in this manner. I prefer the diluted Pyroligneous Acid.

As soon as symptoms of prostration manifest themselves, the above internal treatment must be changed. To overcome the depressing influences of the absorbed putrescency, brewer's yeast may be given internally, ale or porter may also be allowed, and good cider will be found a most salutary and refreshing draught; it may be exhibited frequently. And in the absence of these, an endeavor should be made to sustain the system by wine, ether, ammonia, aromatics, etc.

In conjunction with these, some preparation of Peruvian bark or Quinia must be given. A very excellent mixture is composed of Sulphate of Quinia, three grains, Baptisin, half a grain, Leptandrin, one or two grains; mix for a dose, and repeat as required. It may be given in some Quince or Blackberry syrup or jelly. Various other agents may also be used, combined to suit the indications, as well as views, of the practitioner, as, Cornine, Xanthoxylin, Hydrastin, Ptelein, etc. The female should be kept cleanly, and the apartment which she occupies be well ventilated, and maintained at a moderate temperature.

CHAPTER XXXIX.

COMPLICATED LABOR.—INVERSION OF THE UTERUS—RUPTURE OF THE UTERUS—RUPTURE OF THE VAGINA—RUPTURE OF THE BLADDER—SYNCOPE—THROMBUS.

WHEN attempts are made to abstract the placenta by forcibly pulling upon the cord, and especially if these be made when the uterus is in a flaccid condition, the cord may be broken, or the uterus may be inverted. INVERSION OF THE UTERUS may likewise be occasioned by a rude attempt to effect a removal by pulling upon the placenta itself. It may also be owing to a rapid delivery in a large pelvis; to a short umbilical cord; to delivery taking place when the female is in the erect posture; to violent straining during the last pains of the second stage; and it is stated to have occurred spontaneously, or without any satisfactory cause; but, by far the majority of inverted uteri are caused by improper management of the accoucheur.

This accident may occur immediately after delivery, when it is termed *acute*, or *reducible* inversion; it may not take place for a few days after, in which cases, however, it is stated that a depression of the fundus existed from the first; or, it may happen gradually, in which case, as well as when the acute form has not been removed, it is called *chronic* or *irreducible inversion*. Sometimes it takes place in the unimpregnated uterus, being occasioned by the presence of a tumor, the growth of which enlarges the organ, until its weight carries it through the os with the fundus attached to it.

An inversion of the uterus is one of the most serious accidents that can befall the parturient female. About one-third of the cases prove fatal, either in a very short time, or within a month after its occurrence. Of one hundred and nine fatal cases recorded, seventy-two died in a few hours; eight in from one to seven days; six in from one to four weeks; or eighty-six in one month.

SYMPTOMS.—The inversion may be partial or complete. When it is partial, a portion of the uterine wall, but more commonly the fundus, is depressed within the uterine cavity, presenting, internally, a convex surface. This form may prove fatal. It can be detected only by introducing one or more fingers within the uterus, which will discover the convexity of the depressed part, and by external palpation, which will, if the depressed portion be situated anteriorly, discover the concavity formed by it, instead of the usual globular form of the womb. It is apt to induce violent straining and bearing down efforts, which may eventually occasion a complete inversion; and which efforts, to any great extent, should *always* be prohibited, after the birth of the child, especially when the uterus is in a non-contracted condition. There may be no pains with it, but a sensation of sinking. Hemorrhage usually accompanies it, and in cases where this is obstinate and long-continued, it may be owing to a depression of the above character, which should be ascertained by passing one or two fingers within the uterine cavity.

Again, in a partial inversion, the advance or depression of the fundus may be so extensive as to be grasped by the inferior part of the uterus, or even pass through the os uteri, but without changing the situation of the cervix. In this case the palpation will discover a greater amount of concavity, or perhaps a vacuity above the pubes, and the finger will detect the fundus filling the lower part of the uterus, feeling like an elastic tumor, more or less painful, or it may be felt protruding through the os into the vagina, being soft and convex, and the hand, by being passed up, can recognize the encircling cervix. The pulse will become small, rapid, and fluttering, with sudden prostration or sinking of the vital energies, which happens independent of any hemorrhage; also paleness of the countenance, nausea, vomiting, and violent bearing down efforts. The presence of flooding increases the danger.

In complete inversion, the cervix, as well as the whole body, is inverted; the uterus is completely turned inside out; it may be retained within the labia, but more generally a greater or less proportion of it will be found externally, from an accompanying prolapse and inversion of the vagina. Sudden hemorrhage and sinking occurs, with a sensation of fullness in the vagina, and frequently death supervenes before the practitioner is aware of the accident. If this does not take place immediately, all the symptoms above enumerated exist in a greater degree. Should the uterus contract, hemorrhage will, probably, be absent.

"It will sometimes happen that, for hours after the accident, not a single pressing symptom shall occur. In general, however, when a womb is left in this inverted position, the patient is still liable for hours, and days afterward, to large and even fatal eruptions of blood, of which I have myself been a witness; add to which, that independently of the flooding, mere displacement of the parts may, perhaps, give rise to more or less collapse; obstruction of the bladder, too, is not unfrequent, and the introduction of the catheter may become necessary."—(*Blundell.*)

DIAGNOSIS.—Great care must be taken not to confound an inverted uterus with some other difficulty. It has been mistaken for a head, or a breech presentation of another child, for a placenta, a polypus, a mole, a clot, an excrescence, etc.; and instances are not wanting, where the uterus, mistaken for something else, has been torn from the female by an ignorant practitioner, occasioning the most agonizing torture, followed by a rapidly fatal termination.

In connection with the symptoms and examinations named above, the uterus will be recognized, when its inversion is complete, by its rough, flocculent, and bleeding surface, and by its size and shape. If it can be inspected visually, the fibrous tumor will be of a red color, but which gradually changes to a dull brown when the difficulty becomes permanent.

PROGNOSIS.—Those cases which occur spontaneously are said to be more hazardous than those occasioned by traction of the cord; and the rapid attack of the inversion, accompanied with uterine inertia, greatly augments the danger. The more incomplete the extent of the inversion, and the more slowly it occurs, the more favorable will it be for the patient.

Usually, the hemorrhage, or the severe shock upon the nervous system occasions the death of the patient. Sometimes the inverted organ becomes inflamed, and, being strangulated by the contraction of the cervix , gangrene and sloughing ensue, followed by death; cases, however, have been recorded where such a condition has terminated favorably. Again, when patients have passed safely through the early period of inversion, they have been known to live for many years, without its occasioning them much annoyance; of course, in these instances, the organ very much diminishes in size. Occasionally, the tumor becomes attacked by some malignant form of disease.

Spontaneous reduction of partial inversions, as well as of chronic inversions, are recorded to have been met with. A ready reduction of acute cases is not always successful, as the patient may have been too much exhausted before it was accomplished; or, it may be followed after a few days, or even months, by death, the consequence of the violence which the uterus has suffered. Generally, in these latter instances, the danger returns with the catamenia.

TREATMENT.—In partial or incomplete inversion, two or three fingers, or the whole hand, if necessary, may be introduced within the uterine cavity, and the depressed portion be gradually, but continuously pushed upward. When the reduction is finished, provided the whole hand has been introduced, it should not be removed until contractions have taken place, or else, the inversion may be renewed, or, hemorrhage ensue.

When the inversion is complete, its reduction should be attempted without delay, because, the longer it remains without re-position, the more difficult will be the operation. A delay of an hour or two may render any successful endeavors impossible; and its continuance for one or two days, generally renders it irreducible. However, a few rare cases are recorded in which re-position was effected after eleven weeks had transpired, and one of sixty-six weeks; but such cases are exceptions, and should never be anticipated. Spontaneous reduction of chronic inversion has been noticed by several writers.

In effecting the reduction, it will be found that it can be accomplished with greater facility, the sooner it is undertaken after the occurrence of the accident. There are several modes advised for the operation. One is to grasp the uterus with both hands, lessening its bulk, and steadily pressing upward, so that the mouth, then the cervix, the body, and the fundus, successively pass into their natural positions; this, however, is rather a difficult method, as the pressure exerted upon the organ by the hands, will be very apt to occasion contractions, during which all attempts will be futile.

Another method is, to firmly press the back of the fingers against the fundus, the hand being held in a half-closed condition, and effect the replacement in this manner, which usually takes place with a jerk.

But, probably, the best mode is, to place the fingers in a conical form, press them, thus closed, upon the fundus, indent it, and carry it upward through the os uteri, the body and neck necessarily following.

Several points, however, are necessary to be attended to. The female, if not too much exhausted, must be placed on her back, with the hips considerably elevated above the chest (though when the reduction is attempted immediately after the inversion, this is not so essential), and the legs and thighs flexed and separated. The hand to be employed should be well oiled, and the operation should not be undertaken, nor persisted in, while the organ contracts, but only during its state of softness and relaxation. Before attempting the indentation of the fundus, the inverted organ must first, if possible, be pushed up beyond the vaginal orifice, and no effect will be produced until the upward pressure shall have caused some extension of the vagina. The pressure should not be made against the pubic arch, but in the direction of the axis of the pelvic cavity, and to correspond as nearly as possible with its center; the practitioner *must not forget* the direction of the axes of the straits and pelvis during the operation, as it will only be successful by carrying the fundus upward in their line. Should the perineum interfere with the operation, press it backward while passing the organ by it. The pressure should be firm and continuous, making no effort when the uterus contracts, except that of securing what has been gained, by resisting any tendency toward a return to its first misplaced condition. Most commonly the fundus returns to its normal situation, by a sudden jerk, or start, somewhat like a gum-elastic bottle when turned inside out. Too much force should never be employed in the operation, lest the uterus or vagina be lacerated; a moderate force, steadily persisted in, will prove the safest and most successful. Whatever may be the extent of the inversion, after its reduction, the hand being within the uterine cavity, should be retained there until the contractions of the organ expel it, using means to forward these if required; and be certain that the restoration is complete before allowing the hand to be expelled. A depression of the fundus remaining, may occasion violent bearing-down efforts, followed by a return, and perhaps an irreducible state, of the inversion.

The inversion may happen with complete detachment of the placenta, or it may be more or less adherent. When adherent, there is a diversity of opinion as to the management, some recommending it to be removed, before proceeding with the re-position, and others advising us not to remove it, until the restoration has been completely established.

When the uterus is in a relaxed state, and the placenta is completely adherent, or nearly so, to remove it would be very apt to cause a hemorrhage which might prove suddenly fatal; or uterine contractions might follow the detachment, rendering a reduction of the inversion very difficult, or altogether impossible; hence, in such cases, it were better to return the placenta with the uterus, before detaching it.

When the placenta is detached to a considerable extent, and the remaining adhesions can be readily separated, it may be proper to attempt this previous to the reduction; unless the hemorrhage from the vessels already exposed be very profuse, when the safest course would be to abstract the cake only after the replacement of the uterus. A slight and easily-separated adhesion, cannot seriously augment the flooding, hence, its removal should be accomplished before the operation.

There may be cases in which it will be impossible to return the uterus while the placenta adheres, and here the difficulty will be very great; a detachment of it may be followed by da [illegible] s hemorrhage, or by contractions which wil [illegible] with the su [illegible] he operation.

The case is necessarily one of danger, shall we increase the risks by removing the placenta? Perhaps it may be a better course than to run the chances of a chronic inversion. I cannot speak from experience; but whichever course is adopted, be certain that the reduction is impossible, by a persevering effort, and that the obstacle is the presence of the placenta, and not improper or badly-directed efforts. Several writers state, that in such cases, they have detached the placenta without any subsequent bad results.

Exhaustion and depression of the vital energies must be combated by stimuli and appropriate treatment, similar to that laid down when speaking of hemorrhage. The female should not be allowed to get up too soon after the reduction, keeping her in a horizontal position, with the head depressed and the hips considerably elevated, the knees and thighs being bent, and all strainings at stool should be forbidden, keeping the bowels free by mild laxatives or injections.

When the uterus has once been inverted during a labor, it has a strong disposition to a renewal of the difficulty in consecutive ones; therefore, with such patients it will be improper to make any tractions upon the cord to abstract the placenta; if pressure upon the fundus with frictions will not expel it, the best course will be to introduce the hand within the cavity of the uterus, and remove the mass in the manner heretofore explained.

If the inversion has been of several days' standing, it has been advised not to omit attempts at the reduction, from the fact that it has been reduced, in many instances, after a lapse of weeks and even months. Probably, the Compound tincture of Lobelia and Capsicum might aid in causing sufficient relaxation to permit its reduction; but from the nausea and vomiting which this might, probably, produce, I would prefer the following plan: — Having emptied the bladder and rectum, place the patient under the relaxing influence of the tincture of Gelseminum; at the same time, should the uterus be external to the vulva, envelop it in cloths wet with warm water, without permitting any evaporation to take place, changing them from time to time, if necessary. Relaxation of the muscular fibers of the organ having followed this course, then attempt the reduction. I have never had an opportunity of trying this method, but merely suggest it to the profession; from a knowledge of the influence of the agents named, upon the system, I believe it will be found successful in very many instances of chronic inversion. At all events I should try it, before undertaking any of the severe and painful methods recommended for removing the uterus.

After the replacement of a chronic inversion, the female should be treated the same as advised under the acute form; and, in either form, it may be beneficial to protect the uterus, for a number of weeks or months, from the superincumbent weight of the intestines, by the application of an abdominal supporter immediately below the umbilicus, whose force shall be directed inward and upward.

When the inversion can not be overcome, palliative measures are all that can be recommended, and if the uterus falls out of the vulva, it should be placed beyond external danger, by returning it within the vagina, and retaining it there by a bandage and compress; at the same time using the abdominal supporter above referred to.

It has been advised by several eminent writers to remove the uterus, in irreducible cases, by the ligature, or the knife; and instances are not wanting where its extirpation by these means, or by gangrene and sloughing, the result of its strangulation by the os uteri, has resulted favorably. Still, as long as the female experiences no great amount of discomfort, or any alarming symptoms, I can see no necessity for the operation — it appears to me cruel and uncalled for, especially when we bear in mind, that females have labored under this accident for many years without any very unpleasant or exhausting symptoms. Beside which, cases of spontaneous reduction have been recorded, in which pregnancy subsequently occurred.

However, should the uterus be attacked by some malignant disease, while in this displaced condition, its extirpation may be followed by favorable results. The ligature employed is usually either silk, silver-wire, or whip-cord; it may be applied around the uterus at its highest part, and gradually tightened as the patient can bear it, until the separation has taken place. Should it cause any violent symptoms, it must be loosened for a time, until these have been subdued. The strength of the patient must be kept up by a non-stimulating, nutritious diet.

When the knife is employed, a ligature should be first applied as above, for the purpose of preventing hemorrhage, and the excision be made immediately below the ligature. In a case where extirpation of the inverted uterus would be desirable, instead of the preceding opera-
I would first endeavor to remove it by means of Galvanic Heat,
I believe would effect it without the loss of much blood, or any sub-
it dangerous inflammation. This heat may be applied, by attaching
ina point to the end of a copper or iron wire, then, by bringing the
les of a galvanic battery to act upon this point, a heat will be
ed of sufficient intensity to destroy all animal tissues to which it

may be applied, without any great degree of suffering. I have used this successfully in fistula in ano, and urethral stricture.

Occasionally, instances of a RUPTURE OF THE UTERUS are met with, which generally prove fatal. This accident may occur during pregnancy, or at an advanced period of life, but it is only of its existence during parturition that I shall treat.

Rupture of the uterus occurs more frequently among multiparæ, and especially, it is stated, with male fetuses, who are usually larger than females; it may be owing to several causes, as, a debility or disorganization of the uterine tissue, effected by inflammation during pregnancy; cases of thinning, softening, scirrhus, and gangrene of the uterine walls, have been recorded. An abnormal size of the fetal head, may be a cause; as well as obliquity, or retroversion of the uterus;—transverse presentation of the body, or the head presenting obliquely at the superior strait; the presence of a polypus; an excess of liquor amnii; and plurality of children, have all been named as causes. It may occur from violence, as falls, blows, forcible attempts at delivery by turning or otherwise, and has been known to follow a fit of anger. A rigid os uteri may occasion it, and instances have been observed where the os has been entirely torn off; females who have deformed pelves, or those on whom the Cesarean operation has been performed at a previous labor, are very liable to it. Violent efforts of the uterus itself, and especially when induced by the exhibition of ergot, or stimulants, will tend to lacerate the organ.

Among these enumerated causes, probably, those which more frequently give rise to the accident, are morbid alterations in the uterine tissue; violent contractions of the uterus; a forcible entrance through the undilated os; and undue violence in turning, or otherwise assisting the delivery; though, it may occur during the operation of turning, from some diseased state of the cervix, the operator being blameless. The rupture may happen at any part of the uterus, though it is most frequently met with at the cervix, either anteriorly, opposite the pubes, or posteriorly, opposite the sacral promontory, and generally at the point complained of by the patient as being excessively painful. Its direction is not constant — with some it may be longitudinal, and with others oblique or transverse; and it may be accompanied with a laceration of the vagina.

Its occurrence may be sudden, or it may take place gradually; and the laceration may be complete, extending through the uterine texture and its peritoneal covering; or, partial, being confined only to the peritoneum, or to the muscular texture.

SYMPTOMS.—Rupture of the uterus most frequently follows a powerful effort of contraction, during which the female suddenly screams that something has ruptured within her. The pain accompanying this sensation is very acute and agonizing, and is frequently expressed as "a crampy pain;" and it is the intensity of this which causes the shrieks of the patient. Frequently the rupture is manifested to the bystanders by a tearing or cracking noise.

The pains soon become feeble, or cease immediately, according to the complete or incomplete nature of the rent, and a violent, constant, excruciating pain, entirely different from that caused by uterine contraction, is most generally complained of, as being confined to one spot.

The pulse soon becomes rapid, small, feeble, and fluttering; the countenance quickly assumes a pallid, anxious, and alarmed appearance; the respiration becomes hurried and difficult; the surface is cold and clammy; violent retching ensues, with vomiting of mucus, a greenish matter, or a dark-colored substance resembling coffee-grounds; there is faintness, with an inability to lie, requiring the female to be raised in the bed; external or internal hemorrhage may occur, but the flooding is frequently absent, there being but a slight discharge of blood; and sometimes convulsions happen.

Should the peritoneal coat only be rent, the labor may go on, and the child be delivered; and, occasionally, the last pains which expel the child, may at the same time effect a complete rupture of the uterus.

DIAGNOSIS.—In connection with the symptoms above named, an examination, externally, will discover the uterus contracted in one or the other iliac region, and the child may be plainly detected, through the abdominal parietes, when the rupture is complete. An examination per vaginam will ascertain that the presenting part has receded so as barely to be felt by the finger, unless it be impacted, or, it may have passed entirely out of reach, the child having escaped into the cavity of the abdomen. The death of the fetus generally happens immediately, so that if the fetal pulsations can be heard, it is considered indicative of no rupture. A partial rent is of more difficult diagnosis; we must be guided by the pain, and the collapsed condition of the patient.

PROGNOSIS.—The prognosis is always serious, as very few ever recover from the accident. The shock may destroy the patient immediately or in a few hours after the rupture; if the collapse does not prove fatal, she may die subsequently of peritonitis, or, secondary affections may finally destroy her, as lumbar abscess, sub-peritoneal abscess, etc. Even slight lacerations of the os uteri have proved fatal. If the peritoneal coat be not ruptured, there will be less danger of peritonitis. Metritis will be apt to follow a laceration of the muscular tissue.

Although the fatality attending this casualty is very great, still, cases are recorded in which recovery has followed, and even where children have been given birth to, subsequently; so that in no case is the practitioner to abandon it as irrecoverable—his duty is to use every effort to save his patient.

TREATMENT.—In a labor where, from the violence of the pains, or the presence of a fixed, crampy pain, or other well-founded reason, rupture of the uterus is apprehended, the delivery should, if possible, be hastened—but not by Ergot, or stimulants. It would also be advisable to moderate the pains by the agents heretofore named, as tinctures of Gelseminum, Aconite root, etc. The forceps should be employed when safe and practicable; but if the child be dead, and any resistance be offered to its advance by the forceps, the perforator should be used. Counsel should always be sent for.

If the rupture has occurred, the only chance for the patient is in immediate delivery. If the head be within reach, the child may be cautiously extracted with the forceps; or, if this can not be effected, then the perforator must be used, taking especial care, with either instrument, not to push up the head, lest it slip through the rent into the abdominal cavity. This may be avoided by an attendant making pressure over the fundus, and the operator causing the perforation to be gently made in a direction, as much as possible, toward the sacrum. Should the presentation be of the shoulder, or the face, or the nates, bring down the feet, and thereby hasten the expulsion, as well as prevent the child from passing into the abdominal cavity. The child being delivered, follow the cord, and carefully remove the placenta.

If the child has passed into the ventral cavity, the hand and arm should at once be oiled and insinuated steadily along the vagina, into the uterus, and through the rent into the cavity of the abdomen; the feet of the child should then be seized and brought down, extracting it through the ruptured opening into the uterus, and delivering by the natural passages. This accomplished, reintroduce the hand, if necessary, to remove the placenta. But in either case, be especially careful not to abstract any portion of the intestines along with the child, or placenta; and if any part of them has entered the fissure, remove them, that they may not be strangulated by the subsequent contraction of the uterus. Make no attempts, however, toward their proper replacement; when remaining within the abdomen any interference to adjust them is improper.

But the os uteri may not be dilated, or not sufficiently so for the introduction of the hand, or, after the child has escaped through the rent, the uterus may contract—in either case—rendering delivery by the natural passages impossible; what must be done? It is advised by eminent authority, that if the female has not suffered much from the shock, and other circumstances are favorable, to explain to her the nature of the accident, and with her consent, perform the Cesarean section, and remove the child and placenta through the abdominal parietes. If, however, she be rapidly sinking, or half an hour has elapsed, and the fetus is dead, leave the case to nature. The practitioner will however be guided by circumstances, everything will depend upon his judgment aided by that of his counsel, and no safe means must be left unemployed which may tend to preserve both mother and child.

While the patient is in a collapsed condition, various agents may be given to arouse the vital energy, and prevent it from becoming too far depressed. Stimulants, as Wine, Camphor, Ether, Ammonia, etc., should be given, being careful not to carry their use so far as to increase the danger by aggravating the reaction; also apply stimulants externally.

After the delivery, Opium, Morphia, compound powder of Ipecacuanha and Opium, Hyoscyamus, or other anodyne may be given. The subsequent inflammation must be met by tincture of Aconite root, tincture of Gelseminum, or, compound tincture of Virginia Snakeroot, etc., which should be exhibited freely so as to effect a speedy influence upon the system. Poultices or fomentations of Hops and Stramonium leaves, over the abdomen, with the internal use of mucilaginous diuretics, will also be found of much benefit.

The VAGINA MAY BE LACERATED, in connection with the uterus, or independent of it; it is more unfrequent than uterine rupture. The symptoms resemble those of rupture of the uterus, and are nearly as dangerous. If the laceration be trifling, it is better to leave the case to nature, watching it carefully, however, and bestowing some care to the support of the perineum, as the head passes over it. If there be danger of an extension of the laceration, hasten the delivery, by forceps if possible. The after-treatment will be similar to that in the preceding accident.

RUPTURE OF THE BLADDER, is a more fatal occurrence than that of the uterus, it is extremely rare, and may arise from neglect or inattention of the practitioner, or the improper use of instruments. Its symptoms are somewhat similar to those of rupture of the uterus, as a violent and severe pain in the region of the bladder; a scream from the patient; a sensation of something having given way internally; rapid depression of the vital powers; tumefaction and tenderness of the abdomen; but no recession of the presenting part, or distinguishing the child in the abdomen. The contractions of the womb continue, but grow weaker as the system sinks.

This accident may be prevented by proper care on the part of the practitioner, who will ascertain that the organ is emptied during labor, or if it be full, and the patient can not void the urine, he must introduce a flexible catheter and thus effect the evacuation. When the rupture occurs, the child should be saved, if possible, there being but little hope for the mother. The delivery should be hastened by turning, or the forceps, if the child be alive; and if this can not be effected, the Cesarean operation has been advised. The death of the child usually ensues in consequence of the prostration of the mother.

SYNCOPE, occasionally attacks females either during labor, or subsequently thereto, and may occur independently of hemorrhage, or rupture of the uterus, vagina, or bladder.

Those of a nervous, hysterical, delicate habit, are more liable to it, though it is also met with among those who have prostrated the energies of the system by intemperance, or unhealthy diet with impure air. It may also be occasioned by some organic disease, as of the heart and lungs, or from the rupture of an aneurism, or abscess, in which instances it may prove fatal. It also undoubtedly occurs from the sudden removal of the pressure of the contents of the gravid uterus upon the abdominal viscera and large vessels of the body. Females of a despondent or gloomy state of mind, or who are apprehensive concerning the termination of their labor, are also subject to it.

A prudent exhibition of Wine, Ether, Ammonia, or other stimulants, to invigorate the energies of the system, with moderate warmth, fresh air, depression of the head and shoulders, a sprinkling of Ammonia or Camphor upon the face and neck, and frictions to the extremities, will commonly be sufficient to restore the patient. Of course, when the symptom happens from organic difficulty, the probability of rallying the female will depend upon the character of the disease. When it occurs after the delivery, in addition to the above means, apply friction to the abdomen, together with a broad bandage firmly and properly applied.

Sometimes an extravasation of blood into one or both of the labia pudendi, suddenly occurs during labor, or shortly after the birth of the child, which is termed THROMBUS. It is the result of a rupture of varicose veins of the vagina, or of some of the large bloodvessels.

The affected labia present the appearance of a livid or black tumor, of greater or less size, frequently as large as the head of a child, being accompanied with intense pain.

Dr. Dewees states, that if the inner surface of the attacked labium does not burst in the first instance, the tumor is certain to yield in a short time from gangrene. A large surface of coagulated blood becomes exposed when the part sloughs, which rapidly decomposes and becomes fetid. If the parts do not rupture, the patient suffers most excruciating pain; active fever takes place, with delirium, and her life becomes seriously endangered. A retention of urine increases her sufferings, and relief can only be obtained by making a free incision on the mucous face of the labium, to allow the extravasated blood to escape, and which should be done before the process of ulceration has commenced, or the chance of bursting. Then press the enlarged labium to one side, and evacuate the bladder by means of the catheter.

Thrombus is most commonly present in cases of protracted labor caused by pelvic deformity, and generally proves fatal, especially if not attended to at an early period. Sometimes its progress is very rapid, the blood effused being so great in quantity as to cause syncope; or the mucous membrane may rupture, followed by a cessation of pain, and a hemorrhage, which may be so excessive as to rapidly destroy the patient.

These tumors must not be confounded with inversion of the uterus, or of the vagina, or with cystocele, vaginal hernia, etc.

TREATMENT.—If this difficulty happens during labor, and the tumor interferes with the passage of the head, it should be freely incised on the mucous surface (the extent of the incision being in proportion to the size of the swelling), and the fluid allowed to escape. Should it be, however, excessive in quantity, too great a discharge must be checked by applications of cold, ice, and compression, which must be continued until the engagement of the head, by pressing upon the ruptured vessels, prevents any further flow.

If the thrombus occurs during pregnancy, or after delivery, with only a small tumor, but little discoloration of the skin, and no perceptible increase of the effusion, and no fluctuation, attempts should be made to resolve it, by the application to the parts, of cataplasms of Elm and Arnica flowers, or Elm and flowers of St. Johnswort, aided by warm fomentations to the hands, feet, and legs. And the same course may be pursued after delivery, when the tumor ceases to enlarge, carefully watching, however, and opening it, upon the first appearance of inflammatory symptoms.

If the tumor continues to increase, with debility and sinking of the system, incise it, as before named, evacuate at least the greater part of the clots present, by the fingers, and then make firm and permanent compression upon the whole tumor, together with applications of ice, if the effusion does not readily cease.

Always sustain the strength of the patient by appropriate stimuli, nourishing diet, etc.; and keep down febrile symptoms by the solution of Acetate of Ammonia and Morphia (*See Am. Ec. Disp.*, page 1019), or by the remedies usually exhibited for this purpose. Keep the bowels regular, enjoin quiet, the recumbent position, and cleanliness of the parts, and do not suffer the bladder to become over-distended with urine. The tincture of Gelseminum, with a small proportion of the tincture of Aconite root added, will prevent any subsequent attack of erysipelas, or peritoneal inflammation, in many instances.

CHAPTER XL.

COMPLICATED LABOR.—PUERPERAL CONVULSIONS—ECLAMPSIA—HYSTERICAL CONVULSIONS APOPLEXY—EPILEPSY.

One of the most dangerous and frightful maladies with which the puerperal female may be attacked, is CONVULSIONS (*Eclampsia puerperalis*). It usually occurs during labor, though occasionally met with for some time previously, but seldom before the sixth month of pregnancy; and it frequently manifests itself after delivery, when it is of a more favorable character.

According to statistics, it is fortunately a rare disorder, having occurred in 172 cases of labor, out of 103,537; or about 1 in 602. Primiparæ are more subject to it; instances, however, have presented of multiparæ who were attacked by it in their tenth or twelfth labors. The fatality to the mother, heretofore, has been about one in every four; most commonly the children are still-born. Females with short, thick necks, of low stature, and square form, and of a sanguine temperament, are considered to be more subject to it—yet none are entirely exempt from it. It frequently attacks those who, in early life, suffered from epilepsy, hysteria, or who have received injuries of the head.

Beside the true puerperal convulsions, there are three other varieties which may attack the parturient female, viz: the *hysteric*, the *apoplectic*, and the *epileptic*, each of which will require a separate notice.

HYSTERIC CONVULSIONS, with their treatment, have been referred to under the diseases of pregnancy (*see page* 146). It may be proper, however, to name the distinguishing marks between these and the true puerperal convulsions.

IN HYSTERIC CONVULSIONS.	IN PUERPERAL CONVULSIONS.
1. Consciousness may, or may not be entirely lost; generally the insensibility is incomplete.	1. Consciousness is completely lost.
2. The spasmodic action is moderate, the body being but slightly contorted.	2. The spasmodic action is violent, with powerful and irregular agitation of the muscular system.
3. No frothing at the mouth, and no biting the tongue.	3. Frothing at the mouth, with biting of the tongue.
4. The breathing is not stertorous nor hissing.	4. The breathing is rapid and violent, with a loud, peculiar, hissing sound.
5. The convulsive attacks are not frequent, the patient recovering shortly after each.	5. The paroxysms are frequent, with total insensibility, or incomplete consciousness during the intervals.
6. There may be sobbing, sighing, weeping, and screaming.	6. Sobbing, sighing, weeping, and screaming, are never present.

APOPLECTIC CONVULSIONS, when present, almost always occur toward the termination of labor; and are caused by the pressure exerted upon the cerebral vessels during the contractions of the uterus. They are rarely met with, and most usually prove fatal.

Sometimes no premonitory symptoms will be present; at others, there will be pain, and throbbing, with other disturbance of the head, for several days previously. During labor, there will usually be more or less headache, and in the expulsive stage, the countenance will be flushed, with a fullness of the vessels of the eyes. There will be some agitation of the limbs and body, with but little spasmodic action; seldom any distortion of the face, no frothing at the mouth; the pulse is full and slow, and the pupils fixed, and either contracted or dilated, and insensible to light. The breathing is stertorous; the muscles soon become flaccid and powerless; the patient lies in a comatose condition, and very rarely has a second paroxysm.

The following are the marks of discrimination between these and the true puerperal convulsions:

IN APOPLECTIC CONVULSIONS.	IN PUERPERAL CONVULSIONS.
1. The convulsive movements at the commencement are slight, and are not repeated, the unconsciousness being persistent. Sense and sensibility are completely lost.	1. The convulsions are violent and are repeated, with intervals of quiet, and often a more or less complete return to consciousness.
2. The breathing is stertorous.	2. The breathing is violent, with a loud hissing sound.
3. The muscles become flaccid and powerless.	3. The muscles preserve their tone, even during the intervals.

PATHOLOGY.—The brain will occasionally be found much congested, without effusion; sometimes, the pressure of a great effusion of serum causes the attack; more commonly, blood is poured out into the ventricles, into the substance of the brain, or at its base. It is almost impossible to distinguish the congestive form from that caused by effusion; the principal difference exists in the intensity of the symptoms. (*Churchill.*)

TREATMENT.—Prompt and energetic measures can alone be of service in these cases. Cold water, or ice should be applied to the head and neck, a brisk purgative enema, to empty the lower bowels, should be given as soon as it can be prepared, and warmth and friction should be applied to the inferior extremities and lower half of the trunk. In the application of the water, the head should be withdrawn carefully from the bed, and held over some large vessel to receive the fluid after it has been poured on. If the attack occurs during labor, the delivery should be hastened as speedily as may be done with propriety, but always without force or rudeness.

The above measures should be persisted in for some time. If a return to consciousness follows, administer a purgative as soon as the patient can swallow, apply warmth and counter-irritation to the extremities, and keep the head cool. Always be certain that the bladder is evacuated, and does not become distended.

EPILEPTIC CONVULSIONS, do not vary in their symptoms and treatment, from those of ordinary epilepsy; they very rarely occur with parturient females, unless they have had previous attacks, and are subjects of the disease. But epileptic females are not more liable to puerperal convulsions than others. The symptoms of epilepsy so much resemble those of eclampsia, that it would be impossible to distinguish between them in the parturient female, unless we were apprised of the fact that she had previously been subject to epileptic attacks. And even then, our diagnosis might be incorrect, for the reason that an attack of epilepsy, occurring at this time, might be converted into a true eclampsia. As epilepsy may, however, when manifested during labor, be mistaken for the true puerperal convulsions, it may be proper to name some of the marks of discrimination between them.

IN EPILEPTIC CONVULSIONS.	IN PUERPERAL CONVULSIONS.
1. The *aura epileptica* is observed.	1. The *aura epileptica* is never obser
2. There is usually but one paroxysm; or where there are several. they do not succeed each other rapidly.	2. There are almost always paroxysms, rapidly following each
3. The patient has generally had previous attacks.	3. The patient has never been with epilepsy before.

True puerperal convulsions appear to partake both of the nature of epilepsy and of apoplexy, and are considered by many eminent writers as veritable apoplexy with violent spasmodic paroxysms superadded, the latter being occasioned by the great degree of nervous excitability to which all pregnant and parturient females are liable.

The causes of puerperal convulsions are not well understood. Plethora, compression of the aorta, long-continued mental excitement, highly electrical conditions of the atmosphere, persistent damp, foggy weather, and previous diseases or injuries of the head, have been variously named as predisposing causes. Females, not married, who do not enjoy the pleasures of society, and particularly who are given to the use of liquors, are especially liable to it. It has also been supposed, that a retention of urea, occurring, either from the presence of Bright's disease, or from pressure upon the emulgent veins by temporary congestion upon the kidney, has occasioned the paroxysms. According to Dr. Lever, albuminous urine and puerperal convulsions are frequently met with together, very few cases of the latter occurring which do not give evidences of the presence of albumen.

Twins, excess of the amniotic fluid, death of the child, distension of the bladder, irritation of some part of the alimentary tube, indigestible food, severe labor-pains, rigidity of the os uteri, irritation of the uterine nerves by the introduction of the hand, terror, or violent mental impressions, etc., have all been viewed as exciting causes. Most probably, however, the nervous system of some organ, as the uterus, stomach, bladder, etc., transmits the irritation, which has been occasioned by some derangement of its functions, to the spinal system and the brain.

According to Churchill, Dr. Tyler Smith, "has proved that convulsions are not excited by irritation of the cerebrum alone, but by the primary or secondary effects produced upon the spinal marrow, medulla oblongata, or tubercula quadrigemina. And therefore that the causes giving rise to convulsions may be either, 1, *Centric*, such as pressure on the medulla oblongata from congestion, coagula, or serous effusion within the cranium; loss of blood, morbid elements in the blood; emotion. Or, 2, *Excentric*, acting on the extremities of the excitor nerves, as irritation of the incident spinal nerves of the uterus and uterine passages; irritation of the excitor nerves within the cranium; irritation of the incident spinal nerves of the rectum; irritation of the ovarian nerves; irritation of the gastric and intestinal branches of the pneumogastric nerve; irritation of the incident spinal nerves of the bladder: and as probable causes, irritation of the cutaneous nerves, of the nerves of the mammæ, and of the hepatic and renal branches of the pneumogastric. More than one of these causes may, of course, act at the same time."

Although all females are liable to attacks of this disease, yet those who labor under any of the following conditions, are supposed to be more disposed to it, and such should, therefore, receive the earliest attention of the medical man, in order to prevent its attack; corpulent females; those having short necks; those having firm, solid, unyielding tissues, or who possess great muscular strength; those whose feet and hands swell, and who experience a numbness in the hands, or in the limbs, with swelling of the face, on awaking every morning; those who feel excessively weak, or who labor under partial or complete loss of sensation in one side of the face, or limbs; those who are subject to headache, dizziness, muscæ volitantes, dimness of sight, double vision, seeing only one half of an object, or flashes of light within the eyes; those who experience loud noises in the ears, especially when occurring suddenly, or who feel as if the head had received a violent blow. Anæmic females should receive especial attention.

The proper course by which to prevent an attack in such females, is to keep the bowels and kidneys regular by laxatives and mild diuretics; attend to the surface by occasional bathings, with frictions and the use of a proper amount of clothing; regulate the diet, that it be nourishing, but not gross nor too stimulating, and agrees with the stomach, readily undergoing digestion. Exercise moderately but regularly in the open air, and have all sources of mental anxiety or agitation removed. In addition to these measures, strengthen the uterine nervous system by the exhibition of the compound syrup of Partridgeberry, the compound pills of High Cranberry, compound pills of Black Cohosh, compound pills of Ferro-cyanuret of Iron, or compound pills of Motherwort, as may appear the best adapted to each particular patient. The syrup, first named, will be found applicable to the greater number of cases. Small doses of some chalybeate preparation should be given, in conjunction, to anæmic patients. If there are serous infiltrations, diuretics may be given, as Polytrichum juniperum, Althæa officinalis, Apium petroselinum, etc., with saline draughts, as, Seidlitz powders.

SYMPTOMS.—The most violent puerperal convulsions may take place without any premonitory symptoms; but in the majority of cases they will be met with. For several days previously, or perhaps for only an hour or two, the patient will complain of more or less severe headache; giddiness; dazzling of the eyes; weight and constriction across the forehead; beating of the temporal arteries; disturbance of the sight and hearing, or, perhaps, a sudden loss of sight; ringing in the ears;

rigors; flushed countenance; temporary loss of sensation; stammering, or incoherency of speech; confused thought or memory, slight delirium, and other indications of cerebral disturbance. Occasionally, pains will be felt in the region of the stomach. One or more of these symptoms are premonitory warnings of an attack, and when they exist, demand prompt attention from the accoucheur, who must at once endeavor to prevent the paroxysms by appropriate measures.

No relief being had, the symptoms become aggravated until the attack occurs. The face now becomes more flushed and swollen, the eyes fixed, and the pupils dilated; though occasionally cases will be met with, in which the pupils contract closely. The patient rapidly becomes unconscious. The voluntary muscles of the system become violently and irregularly convulsed. The head is rotated by jerks from right to left, or backward, and the limbs are thrown with spasmodic violence in every direction, requiring powerful efforts to keep the female in bed. The muscles of the face are commonly affected at first; the eyes roll rapidly about, being frequently thrown upward and inward to the root of the nose, and irregular convulsive twitchings may be observed about the mouth and eyelids. The lower jaw becomes firmly and spasmodically closed against the upper, or it may be drawn to one side. The tongue is involuntarily protruded, and is generally of a livid color, and if some care be not taken, the spasmodic closure of the jaws will severely wound it, so that the frothy saliva which is blown from the mouth, sometimes to a considerable distance, will be tinged with more or less blood; this may be frequently prevented by placing a cork between the teeth, as soon as they become separated. The breathing is rapid, irregular, and violent, and is accompanied with a loud, peculiar hissing sound, owing to the presence of froth and the compression of the lips and teeth. The pulse varies, but is generally quick, full, and hard, at the commencement, but finally becomes slow and hardly perceptible. The face is distorted by the spasmodic contractions, and becomes turgid and livid, and in which color the hands, and feet, as well as the body, participate. Frequently the contents of the bladder and rectum are involuntarily evacuated.

Occasionally, the muscles of one side of the face and body are only convulsed, but, as the spasms cease, those of the opposite side become affected.

After a certain length of time, varying from a few minutes to half an hour, the violence of the convulsive motions diminish and gradually cease altogether; the features begin to appear more natural, the pulse is still quick but more readily discernible, restoration of the circulation takes place, and the breathing becomes more regular. Consciousness slowly returns in a greater or less degree; the female, awakening, apparently, as if from a sleep, may be aware that something uncommon has occurred, or, as is more generally the case, she may have no recollection whatever, her mind being more or less confused. Pain in the head is nearly always complained of. After an interval of quiet, varying from fifteen minutes to two or three hours, the paroxysms return, when the same phenomena take place as before, followed by another interval; and thus the paroxysms and intermissions follow each other, until they cease entirely. I met with one female, in my early practice, who had sixteen paroxysms in as many hours. Very frequently, in these convulsions, the consciousness returns very slowly, and immediately upon its first manifestation, a paroxysm comes on.

Consciousness does not, however, return in all cases; not unfrequently the patient, during the intervals, remains motionless and insensible, with stertorous, or hissing respiration, somewhat resembling coma or asphyxia, and which may soon prove fatal; or, she may be unconscious and restless, throwing herself about in the bed, until the next convulsive paroxysm.

Most commonly the duration of the convulsion does not exceed five or ten minutes, while the intervals may extend to even twelve hours in some cases, and but a few minutes in others.

When convulsions occur in the pregnant female, it is seldom that she will complete the full term, and the child will be still-born, and frequently putrid; probably, the paroxysms may at times be caused by the dead child acting as a foreign irritant to the uterus, its death having taken place previous to the attack. Occasionally, the spasms cease spontaneously, without endangering pregnancy; but more frequently, uterine contractions are aroused, which generally expel the child, and this may happen without any consciousness on the part of the mother.

If the convulsions come on before the occurrence of labor-pains, at the full period, they usually cause dilatation of the os uteri; and the uterine contractions which may follow, will be feeble, irregular, and apparently spasmodic, often alternating with the convulsive paroxysms.

During labor, there may or may not be a suspension of the contractions of the uterus; but more commonly it participates in the general spasmodic irritability, and contracts powerfully, affecting delivery without the patient being aware of it. The paroxysm usually ensues just upon the return of uterine action, though not always with each pain. Generally, the ordinary character of the pains are not changed by the convulsions, and the labor proceeds regularly, unless hastened by art. Not unfrequently, however, the action of the uterus becomes inefficient, and the delivery must be artificially completed.

When puerperal convulsions occur during labor, they most frequently cease when delivery is effected, or soon after, unless they prove fatal; and the patient is generally left with a strong tendency to metritis and peritonitis.

Puerperal convulsions may terminate by recovery; by developing some other disease, as paralysis, cerebral lesions, mania, epilepsy, rupture of the uterus, metritis, peritonitis, etc.; or, by death.

The recovery may take place rapidly, especially when the paroxysms have been few and of a mild character; or, it may be tedious and for a long time uncertain; the intellectual faculties very gradually returning to their normal condition, the memory being excessively debilitated, or destroyed, as well as the hearing and sight. This derangement may continue for a day or two, or may extend to several months before complete restoration takes place.

When other diseases are occasioned by the convulsions, the patient may ultimately recover, but generally with impaired health for the remainder of her life; and frequently these diseases contribute to a more or less speedy fatality. Death most usually occurs when the paroxysms are of great intensity and long duration, with short intervals between them, and especially in those cases where the female remains motionless and unconscious during the intermissions. It may be caused by effusion on the brain, or by a too prolonged and complete suspension of respiration; also by a rupture of the uterus.

The above description of symptoms, together with the preceding tables for distinguishing the attack from hysteria, apoplexy, and epilepsy, will render it unnecessary to detail any further *diagnosis*.

PROGNOSIS.—This is undoubtedly an extremely fatal disease, the most favorable statistics showing that one-fourth of those who have been attacked by it, were lost. But the practitioner may generally be enabled to form a prognosis, somewhat approximating positiveness, by ascertaining the cause that produced the attack, and by observing the period at which it occurs, and the progress and character of the symptoms.

If the paroxysms are very severe and of long duration, the intervals being short, and no return of consciousness, the patient lying in a state of stupor with stertorous breathing, she will be in a very critical situation, and more especially if she be insensible to the application of stimulants. The longer the duration of the intervals, and the more perfect and rapid the return of consciousness, the more favorable will be the case, notwithstanding the severity of the paroxysms. And the milder the convulsions, with the last-named character of intervals, the less will be the danger.

Females whose nervous systems are extremely susceptible, who are hysterical or subjects of epilepsy, or whose minds are very sensitive, are less apt to have formidable attacks, than those who are disposed to apoplexy, or coma, or who are laboring under serous infiltrations.

Convulsions occurring during pregnancy, or during labor, are more dangerous than those which take place only after delivery; and when they occur early in labor, before the parts are sufficiently dilated to admit of the ready expulsion of the uterine contents, they are less favorable than toward the termination of the delivery, when this may be effected either naturally or artificially. They are likewise more fatal among primiparæ.

When the convulsions come on during the last stage of labor, and continue equally strong after the delivery, whether this has been effected naturally or artificially, the case is extremely dangerous; but if the patient falls into a gentle sleep, with an arrest of the paroxysms, after the expulsion of the uterine contents, they seldom return, and convalescence ensues. After the delivery and the disappearance of the convulsions, the practitioner must carefully watch the patient in order to guard her against any subsequent abdominal inflammations, more especially if puerperal peritonitis be, at the time, a prevailing complaint.

The maternal disorder necessarily exerts an unfavorable influence upon the child, and we find that the major part are either still-born, or die in a few days after birth, of convulsions, having, probably, while in utero, received the germ of the disease through the mother's blood.

PATHOLOGY.—Post-mortem examinations have shed but little light upon the nature of puerperal convulsions, no appreciable anatomical lesions having been found—no traces of injection nor changes in the characters of the tissues.

Sometimes a serous effusion has been observed in the ventricles, or arachnoid cavity, and perhaps a slight congestion of the encephalic vessels—but these are viewed as secondary lesions, being merely the effects of the convulsions, when the cerebral congestion is very great. The heart is commonly empty and relaxed. [illegible] ale, and occasionally, fluid has been met with in the [illegible] traces of peritoneal inflammation have like [illegible]

TREATMENT.—The indic [illegible] eral convulsions, are 1st, to subdue, sy [illegible] cerebral congestion, and equalize the circulation; 3d, to hasten the delivery, when labor is on, by the most appropriate means, provided the paroxysms are not subdued; and 4th, to prevent any secondary attacks, and gradually strengthen the patient.

For the fulfilling of the first indication, bleeding to the amount of from thirty to sixty ounces, and taken in a full stream from the arm or temporal artery, has been recommended; indeed it is *the remedy*, and the *principal remedy* upon which the majority of practitioners rely. In former years I was in the habit of bleeding in these cases, and with various results, but I am now thoroughly convinced that many of the unsuccessful cases could have been saved by different treatment, and that, in the successful ones, the bleeding effected but very little service. Indeed, what benefit can any thinking man consider to be the consequence of excessive bleeding, when, at farthest, but only one out of every four patients is saved? Beside, those who are saved by these excessive depletions, rarely have a complete restoration to health subsequently, but linger for a longer or shorter time, under some malady resulting from the bleeding, and which ultimately occasions their death. These large bleedings seriously injure the vital force, and, I believe, frequently prevent recovery where it might otherwise have taken place. The treatment which I shall now recommend to the profession, in puerperal convulsions, will be found fully as successful as the depletive one just referred to, and vastly superior to it, inasmuch as it does not cause any serious affections from sudden, excessive, and persistent prostration of the vascular and nervous systems.

For the accomplishment of the *first indication* above named, one of two articles may be exhibited to the patient, viz: the tincture of Gelseminum, or the compound tincture of Lobelia and Capsicum. The tincture of Gelseminum employed, must be a good article, must be made from the fresh root, and kept free from exposure, in well-stopped bottles. As the active principle of this agent depends upon a volatile constituent, any concentrated preparation, as Gelsemin, is worse than useless, because of the delay of proper measures when this is given, vainly trusting to its efficiency. I have become acquainted with several instances in which a want of success from the use of this tincture was owing entirely to its inertness, caused by exposure or mal-preparation. It is a valuable agent, and to be cast aside as inefficient or uncertain, from an ignorance of the above circumstances, would be a very regretful matter to the profession. The dose of the tincture must be proportioned to the severity of the paroxysms; if mild, one or two fluidrachms may be given; if severe, half a fluidounce. The dose should be repeated in ten or fifteen minutes, during the intervals, after which a longer delay may be had in giving the third dose, according to the severity of the convulsions, and the duration of the intervals—not administering it so often when the intervals are of considerable length.

If the patient is in a state of coma during the intervals, it will be difficult to cause her to swallow, still this may be accomplished by carefully watching for the proper moment; but if it be impossible to get any of this tincture into her stomach, the compound tincture of Lobelia and Capsicum, above named, must be substituted.

The use of this tincture must be continued in this manner, until it has exerted a positive influence upon the muscular system of the patient, rendering it powerless, when its further exhibition will not be required, unless there be a return of the paroxysms. However, the patient should always be placed under its relaxing influence as soon as practicable.

Frequently, this agent will not only overcome the spasmodic tendency of the voluntary muscles, but will at once relieve cerebral congestion, favor the dilation of the os uteri and thus aid in hastening delivery when labor is on, and also prevent any disposition to subsequent abdominal inflammations.

The compound tincture of Lobelia and Capsicum may be given in half fluidounce doses, repeated every ten or fifteen minutes. It does not produce so great a degree of muscular relaxation as the Gelseminum, but has a greater antispasmodic influence, and which is generally manifested much sooner. In some respects it is superior to that agent—thus, it may be given *during* the paroxysms with advantage, which is not the case with the other, at least as far as my experience goes—beside, should the female have eaten a hearty meal immediately previous to the attack, it will occasion emesis, and thus relieve the stomach, without a loss of its other influences upon the system.

Usually, it is impossible for the patient to swallow a single drop of fluid while the fit is on, but if the little finger be placed in one corner of her mouth and the lips be drawn outwardly, so as to admit the practitioner to pour in, gradually, the above compound tincture, it will be certain to reach the stomach—or, at least, the greater portion of it will. The same result will ensue when the patient lies in a comatose condition.

A paroxysm may be frequently shortened in its duration, by the exhibition of this tincture while it is on; and its administration at this time, does not contra-indicate, nor interfere with the employment of the tincture of Gelseminum during the intervals, should this be deemed necessary.

The practitioner must take advantage of the depression of the lower jaw at the commencement of each paroxysm, to insert a piece of cork, or a roll of muslin, linen, or leather, between the molar teeth, for the purpose of protecting the tongue from injury, and which should be kept in its place by an assistant. He should also remove everything, against which she might throw herself and produce some harm.

For the *second indication*, various measures are required. The bowels should be emptied by an injection as speedily as possible, and for this purpose I prefer a mixture of warm Water, Molasses, each half a pint, and Salt two drachms, to which a fluidounce of the compound tincture of Lobelia and Capsicum is added. This injection should be repeated occasionally, until a free and copious alvine evacuation has been produced, after which, if the continuance of the convulsions renders it necessary, half a fluidounce of the above compound tincture, very slightly diluted with warm water, may be injected, and repeated from time to time as the urgency of the symptoms require. Used in this manner, the tincture exerts considerable relaxing and antispasmodic influence upon the system.

For the purpose of facilitating the action of the bowels, it has been advised to place a few drops of Croton Oil, rubbed up with a little sugar, sugar of milk, or butter, upon the tongue,—and which may be repeated within a reasonable interval, if the first dose fails to accomplish the cathartic result. This will often be beneficial; but it is always desirable to obtain these copious evacuations from the bowels at as early a period as possible; and the greater the degree of cerebral turgescence, the more active must be the catharsis.

Counter-irritation must be applied to the feet and extremities, especially where the patient is comatose. The whole of the inferior extremities should be enveloped in mustard, carefully watching that it produces only its rubefacient effect, after which it must be removed, and the feet and limbs wrapped up in flannel wet with the following compound, and applied as warm as can be borne:—Spirits, Vinegar, of each half a pint, Capsicum four drachms, extract of Stramonium two drachms, mix and warm it. This should also be applied on flannel to the back and along the whole length of the spinal column. Cloths wet with a strong infusion of Lobelia and Stramonium leaves, should be applied over the whole abdomen, and especially over the hypogastric region, as hot as may be deemed sufficient, so that the skin be not scalded, and these should be changed frequently. These last measures of counter-irritation and fomentations must be continued during the intervals as well as in the paroxysms.

A most important part of the treatment in accomplishing the second indication, and which must never be omitted, is the cold douche, but which is to be used only during the paroxysms, or during the intervals *when the patient is comatose.* Having the head and shoulders drawn beyond the edge of the bed, and sustained there by one or two bystanders, place a tub or some large vessel beneath to catch the water, which must be poured, quite cold, upon the head and neck of the patient, and this should be continued until two or three pailfuls have been used, or until the features shrink. Then replace her in the bed, with the head and shoulders elevated, and, if necessary, apply ice or cold water to the head, until it is deemed proper to repeat the cold douche. This must be resolutely persisted in, until the action of the cerebral vessels becomes diminished, and their congested condition relieved.

During the intervals, when the patient becomes wholly or even partly conscious, and the cerebral congestion has been somewhat overcome, ligatures may be applied around the thighs, for the purpose of preventing too much blood from being thrown into the trunk and head. This will answer a much better purpose than bleeding, as it does not withdraw any of the vital fluid from the system, but some care must be observed that they are not allowed to remain on too long.

Perhaps, cups to the head, nape of the neck, and lumbar region, which have been advised by some, may be advantageously employed, but they cannot be readily applied during the paroxysms, and during the intervals I would prefer the means already named. I have never used cups in this disease.

All these means may not be required in every instance, but when the convulsions are intense, with excessive cerebral congestion, they should all be promptly, energetically, and persistently brought to bear upon the disease; and it must be truly a desperate case, which cannot be overcome by their timely application. Of course, no cure can be expected where there is considerable effusion on the brain; but as we can not determine with positiveness whether this has occurred or not, we should be persevering in our efforts, however hopeless the case may appear.

During the continuance of the attack, the bladder should be attended to, and evacuated by the catheter on the occurrence of an interval, if it becomes too much distended; and after the delivery of the child, be careful that the placenta is not retained.

The *third indication* obtains only when the treatment fails to overcome the disease. Frequently, during labor, when the child is delivered, the convulsions cease, and from a knowledge of this fact, some writers have recommended the hastening of the delivery, even when the os uteri and other conditions present are not sufficiently advanced for that purpose; and the consequence has been, that more females have been destroyed by officious and forcible delivery, than have been lost by leaving them to the natural resources of the system. "It is far better that the woman should die convulsed in the hands of nature, than that she should perish by the cruel and savage operation of rough and unskillful midwifery."—(*Blundell.*)

When the accoucheur has faithfully employed the various means recommended for the removal of puerperal convulsions during labor, and no favorable impression has been made upon them after a reasonable time has progressed, he may then ascertain whether the condition of the parts are favorable for an artificial delivery: indeed, it is proper for him to examine from time to time while the fits last, lest the child be expelled unconsciously; also, to learn how the labor is progressing, and what may be the influence exerted upon it by the spasms. But he must be extremely cautious how he interferes with the delivery, lest his attempts prove more fatal than the disease. It is not always that the evacuation of the uterus is followed by a cessation of the convulsions: and not unfrequently these become aggravated by the attempts made to hasten the labor. When the female manifests periodically much uneasiness, moaning, and groping and writhing about, it is indicative of uterine contractions taking place; and when the head is at the perineum, she will frequently be observed to strain.

In a case where interference is indicated by the severity of the attack and its unyielding character, if the os uteri be found rigid, or soft and dilatable, but not fully dilated, the accoucheur must positively make no attempts either at aiding dilatation nor at rupturing the membranes: he must wait—he must be patient, until complete dilatation is nearly accomplished, when he may rupture the membranes—a course which frequently expedites the labor; but he must not attempt turning, even should it be a breech presentation: turning is a very hazardous measure in convulsions, but few females having recovered where it has been performed. Mal-presentations, according to the observations of accoucheurs, are very rarely met with in puerperal convulsions. If, however, the head be found in the pelvis, and within reach of the forceps, and the instrument can be readily applied without injury to the patient, the delivery may be terminated by it. But no attempts at artificial delivery must be made while the paroxysms are on, unless the patient lies in a motionless and comatose condition; else, irreparable injury to the soft parts may accrue, owing to the violent struggles of the patient: and should a fit come on during the application of the blades, they must be immediately withdrawn, to avoid their being forced through the walls of the vagina or uterus.

If the head be found steadily advancing, without any delay in its progress, artificial aid is not required, no matter how intense and obstinate the attack may be. Sometimes the head may be so firmly fixed in the pelvis as to resist all justifiable efforts to remove it with the forceps—here the perforator would be indicated; but unless the child is known to be dead, and there is a strong possibility of benefit to the patient, it were better not to resort to it. However, the judicious practitioner will be guided more by the circumstances of the case, than by any specific rules.

"Of 200 cases recorded, one half were delivered by natural efforts; 22 died, or about 1 in 4½; of 35 delivered by the forceps, 13 died, or about 1 in 3; of 43 delivered by the perforator, 12 died, or about 1 in 4; of 14 delivered by turning, 8 died, or about 1 in 2."

The *fourth indication*, to prevent any secondary attacks, and gradually restore the tone of the system, is called for when the convulsions have ceased. Whatever may be the condition of the patient at this time, whether she complains of pain in the head, or in the abdomen, or even whether she be maniacal, the apartment which she occupies must be darkened, the greatest stillness must be observed, and every source of irritation removed, that she may be kept as quiet as possible. The lightest nourishment only should be permitted, at first, as, mucilage of Gum Arabic, Barleywater, Ricewater; afterward, as her strength improves, Sago, Arrowroot, and weak Beef-tea, gradually increasing the diet as convalescence progresses. The bowels and bladder should be attended to, regulating the former either by injections, or internal laxatives, as circumstances will allow. A proper management of the above measures will be of more service than any medicines which may be given.

However, medicines will sometimes be required when distressing symptoms, or symptoms indicative of some secondary attack, are present; among which the following have been advantageously employed:

1. Take of extract of Belladonna six grains; Morphia two grains; sulphate of Quinia twelve grains—mix, and divide [illegible] twelve powders, or pills, regulating the dose [illegible] ceptibility of the patient to its influence, and exhibit [illegible] times a day. In the severe headache, or mania, [illegible] be of service.

2. Take of compound powder of Ipecacuanha and [illegible]

sulphate of Quinia one grain—mix for a dose, to be repeated two, thre or four times a day.

3. Take of extract of Belladonna, Musk, each, six grains; Camph three grains; sulphate of Morphia from half a grain to a grain—mi and divide into six pills, of which one may be given three or four tim a day.

4. The tincture of Gelseminum, combined with sulphate of Quini or with tincture of Aconite root, will likewise be found a valuabl remedy in removing these secondary attacks; in many instances provin superior to the preceding preparations.

Of course, though I have specified the doses above, the careful pra titioner will be guided in the administration of his remedies, in al cases, according to their influences upon the system, and the suscep bility of his patient, and never by any exclusive or arbitrary rules.

In the treatment of puerperal convulsions, inhalation of Ether, an of Chloroform, has been highly recommended by several emine accoucheurs. I have never employed either in these cases, though no from any particular objections I have against their use, but becaus have succeeded without them. From self-experience, therefore, I ca say but little about their utility. Several practitioners have inform me, that they exhibited Chloroform with successful results; and I kno of two cases in which, from some cause, it failed to produce any infl ence whatever. Prof. Cleaveland speaks favorably of its use, and he related to me a case in which he kept a female partially, but contin ously, under its influence for four and a half days, before the convulsi disposition was subdued. In the absence of the agents heretofore reco mended, I should not, under certain circumstances, hesitate to admi ister Ether, or Chloroform; but I think I would never employ either o them in those cases where there were symptoms of very great cerebr congestion, and especially where the patient remained in a state o coma or stupor, during the intervals between the paroxysms.

Before closing this chapter, I would suggest, as a useful auxiliary i the treatment, *bastinadoing the soles of the feet.* I have frequentl adopted this plan in apoplectic attacks, and in cases of great congesti of the cerebral vessels, with marked success. It should be done durin the paroxysm, and also during the intervals when the patient lies in a state of stupor, or coma. It may, at first sight, appear a rough mea ure, but the life of a human being is at stake—beside, it is less obje tionable, and certainly more philosophical, than to remove that fluid i large quantity which is so essential to health and life—the blood.

PART IV.

OBSTETRICAL OPERATIONS.

CHAPTER XLI.

TURNING, OR VERSION.—CEPHALIC VERSION—PODALIC VERSION—THE FILLET—THE VECTIS, LEVER, OR TRACTOR—BLUNT HOOK—CLEAVELAND'S PLACENTAL FORCEPS.

ALL operations during labor, for the purpose of artificial delivery, whether manual or instrumental, are necessarily accompanied with more or less danger, and, hence, they should never be attempted, for any purpose whatever, unless nature is found incompetent to terminate the delivery, or, when absolutely required to preserve the mother's life, or that of the child, when the mother is in a hopeless situation.

The great sacrifice of health and life, among females, from indiscriminate and unjustifiable interference, has led many practitioners to set aside all artificial means of relief, and to rely entirely on unassisted nature, in every case of labor. This, however, is passing into another extreme, and is decidedly wrong; aid is sometimes demanded, and then it must be given—to withhold it would be criminal; and it is among these cases, in which the properly educated accoucheur distinguishes himself from the ignorant pretender, by his calmness and prudence, his proper selection of the time for affording assistance, as well as of the means to be used, and the cautious and skillful employment of these means.

Let the student remember, that in no case are the efforts of nature to be intermeddled with, either by manual or instrumental operations, unless it be *absolutely* and *positively* known that they are insufficient to complete labor. Prolapsus of the uterus, rupture of the uterus, inv sion of the uterus, profuse hemorrhage, peritonitis, permanent dysm orrhea, laceration of the vagina, and also of the perineum, etc., e have frequently resulted from ill-timed, injudicious, and unwarrantal endeavors at forwarding the delivery. These accidents have occurr in the practice of the most eminent obstetricians in instances where t greatest care and prudence were exhibited; how much more readi then will they happen in the practice of the ignorant, officious, a unconscientious practitioner? Were females, or their husbands a friends, generally aware of the great want of skill and knowledge this department of medicine, which prevails so extensively in the p fession, and which is based upon the fact, that in the majority of lab the unassisted and natural resources of the system are adequate to t task of completing labor, they would be more careful and scrupulous their selection of obstetric attendants, and by this means would comp students to be more attentive to the means of becoming efficient a skillful. I do not refer merely to a want of knowledge and practice labors actually requiring assistance, but, more particularly to those which no aid is needed, and in which the practitioner destroys eith health or life, by vain and ignorant displays of unwarrantable manip lations.

Among the operations occasionally required during labor, and which some reference has been made in the preceding pages, that TURNING, or VERSION, may be noticed. According to Churchi 49,323 cases in English practice, required turning in 190 instances, about 1 in 260; 37,479 cases in French practice, required it in 4 instances, or about 1 in 93½; 21,516 cases in German practice, requir it in 337 instances, or about 1 in 64. Making 927 cases of version o of 108,318, or about 1 in 117. In 192 cases, in which the mortality the mother has been named, 12 died, or 1 in 16. In 565 cases, 1 children were lost, or nearly 1 in 3. Some allowance must be ma however, for the various and serious accidents which render the oper tion necessary.

There are two modes of turning mentioned by writers; one, t CEPHALIC VERSION, or *Version by the Head*, in which the head brought to the pelvic brim; the other, PODALIC VERSION, or *Tu* *ing by the Feet*, in which delivery by the feet is substituted for that the original presenting part.

CEPHALIC VERSION, has been recommended at various times eminent accoucheurs, but, heretofore, it has not proved so efficacious could be desired, and hence is not much practiced. It has been advi in mal-positions of the vertex, in face and ear presentations, and sometimes in shoulder presentations; but where prompt delivery is demanded, turning by the feet is preferred. In reply to objections, that it is difficult to seize the head firmly, and bring it to the brim, Velpeau observes: — "1st, It is not always very difficult to seize the head, and to exert considerable force upon it; 2dly, if the waters have not been long discharged, one may often without difficulty seize the vertex, and bring it to the center of the brim, however far it may have been distant; 3dly, that in general it is better to force the head to descend, by pushing up the presenting part, than by bringing down the head; 4thly, that delivering by the breech is far from being a simple and safe operation; as regards the child, it is less so than cephalic version, even if the forceps should be afterward applied." Nothwithstanding this reply, there is much weight in the objections; and attempts to push up the presenting part will frequently induce such violent uterine contractions as to cause the operator to desist. (*See quotation from Prof. Wright, page* 405).

PODALIC VERSION, or *turning by the feet*, is the operation generally practiced and preferred in those cases where a change of position, or prompt delivery is required. It possesses several advantages as well as disadvantages. The *advantages* are, that the accoucheur has the labor more completely under his control, and can deliver or not, as the case may require, with or without uterine action; it is nearly equal, in point of safety, to vertex labors, and is superior to any other; it is frequently the only method by which to save the child's life, or to avoid exvisceration; and often it is the only chance for the safety of the mother. Its *disadvantages* are, that the risk to the mother's life is always enhanced by an introduction of the hand into the uterus; that it is sometimes very difficult, if not impossible to effect it; and that the fatality to the children is very great where it has been performed, about one in three being lost.

The *cases in which turning may be effected* with advantage, are in shoulder presentations; transverse presentations of the body; mal-positions of the head; difficult breech labors; placenta prævia; hemorrhages; convulsions; prolapse of the cord; rupture of the uterus; syncope; and whenever the mother's life is jeopardized. It must not be forgotten, however, that turning is never to be attempted when the head has passed through the brim into the pelvic cavity; delivery must, in this case, be effected by the forceps, or perforator. When the head passes into the vagina, the cervix will contract around the neck of the child, and it will then be impossible to return it into the uterus.

But when the head has not completely passed beyond the os uteri and the superior strait into the vagina, it may be pushed upward into the uterus, and version may then be accomplished.

The most important point for the accoucheur to determine, is the *suitable time for the operation;* a precipitate interference, or too long a postponement, are equally fraught with danger. There are, however, instances in which delivery by turning should be promptly effected, and others, again, in which it should be delayed.

Turning, when required, should always be accomplished as soon as possible, in placenta prævia, in preternatural presentations, in profuse hemorrhage, and whenever symptoms arise which threaten the life of the mother or child, *provided,* in each instance, the os uteri be soft, dilatable, and sufficiently dilated.

It should be delayed when the os uteri is rigid, or soft but not sufficiently dilated; and, when the membranes have been long ruptured, the liquor amnii having entirely escaped, and the uterus contracting powerfully upon the fetus.

At an early period of labor it is very difficult to detect a mal-presentation, or a mal-position, although it may be suspected by the shape of the protruding bag of waters, as heretofore mentioned, (pages 380, 392); but, when the os uteri has nearly completed its dilatation, and more especially when the membranes have ruptured, any preternatural presentation may be correctly determined. And this period is always the most favorable for the operation of version. Should, however, a mal-presentation, requiring turning before labor can be terminated, be detected before the membranes have ruptured, (as a shoulder presentation, or placenta prævia, etc.), the operator may attempt the version, as soon as the state of the os uteri will permit the introduction of the hand, without the employment of force; in this case, as the hand advances, the membranes become ruptured, the wrist and arm prevent the liquor amnii from escaping, the uterus remains distended, and the turning is readily accomplished. But, although prompt action of this kind is required in placenta prævia, or hemorrhage, a delay, until the os uteri is fully dilated and the membranes ruptured, does not necessarily occasion any greater risk in a presentation of the shoulder.

When the os uteri is rigid, or when, the waters having been long discharged, the uterus contracts powerfully upon the fetus, no attempts at introducing the hand must be made until the rigidity has been overcome, or the irritable condition of the uterus lessened by the means heretofore named, (pages 313 and 401).

Turning has been advised as a substitute for the employment of the perforator, in some cases of narrow or deformed pelvis; but, from the dangers incident to the operation, and the difficulty in correctly ascertaining the relative proportions between the fetal head in utero and the pelvic diameters, it seems to me an infeasible plan. The risks to the mother must be greatly augmented by the operation, while those to the child will be by no means diminished.

The mode of performing podalic version, has already been described on page 396; the principle of operation is about the same in all cases. I will, therefore, at this place merely recapitulate. Empty the bladder and rectum, the first more especially; place the female on her back, with the hips brought a little over the edge of the bed, her feet resting on two high stools, and properly supported. Protect the floor from the discharges. Select that hand for the operation, whose palmar surface corresponds to the anterior surface of the child's body. (If an arm presents, secure it by a ribbon, in order to prevent its rising and interfering with the passage of the head.) The hand and arm must be oiled, and the former carefully introduced, in a conical form, within the vagina, *during a pain;* it must be passed into the uterine cavity *during* the *absence of pain*, while, at the same time, the external hand must be placed on the abdomen, over the fundus, to support the uterus; seize the child by the knee, (hooking the finger in its flexure), or by the feet, being careful that a foot and not a hand be grasped, and turn the child during the *absence of pain*, bringing the inferior extremities downward and over its front. If the limbs be brought over the back of the child, the spine may, probably, be dislocated. The traction must be gentle and continuous, and not by jerks or forcible measures. Be careful to so manage the operation, that at the last stage of the delivery, the face of the child will be in the hollow of the sacrum. When the version is finished, replace the female in the bed, and leave the delivery to nature; or, should it be necessary to effect this artifically, wait for the uterine contractions and act in concert with them; for if the tractions be continued, and the delivery completed without uterine action having taken place, the sudden evacuation of the organ would be apt to give rise to inertia, hemorrhage, or other difficulties. While the hand is within the uterine cavity, should a pain come on, do not present the knuckles for the organ to contract upon and run the risk of rupture, but grasp the body of the child with the open hand, removing it from the child's body, only when the pain has ceased. When the uterus acts powerfully and vigorously, it interferes with the introduction of the hand, as well as the detection of the feet, and the version; and the operation becomes not only a difficult one, but painful to both the physician and patient. The operation is, however, comparatively an easy one, when the uterus does not act with much force.

The hazards to which the mother is exposed in the accomplishment of version, are, 1st, a rupture of the vagina, through which the fingers or hand of the operator may pass, and which may be occasioned by the employment of too much force, omitting to support the fundus externally, or, a neglect in passing the hand in the direction of the pelvic axes. 2d, If the search for the feet be conducted rudely or forcibly, the hand may be driven through the uterine walls. 3d, The hand of the operator, or the limbs of the child may so bruise or injure the uterus as to occasion subsequent inflammation; but this may arise independent of such injury. 4th, The shock to the nervous system is usually more serious than in natural labors of the vertex or breech.

The child may be destroyed by compression of the cord; or its hip, or spine may be dislocated by forcible traction, or perhaps a limb may be actually torn from it. It must be recollected, that the cord commences being compressed at the period when the nates emerge from the vulva; hence, the greater the delay in the delivery after this time, the more dangerous is it for the child — artificial respiration may be attempted, even while the head is in the vagina.

Some writers recommend us to seize the hips and bring them to the pelvic brim, but this is difficult and seldom attempted; others advise, instead of searching for the feet to bring down the knees when these are readily obtained; for the purpose of turning, I can see no objection to this plan. As stated on a preceding page (397), it is recommended to turn by one foot, instead of two, more especially on account of the increased dilatation of the soft parts, which must follow, and thus afford greater facility for the expulsion of the head. Generally, this will be found to answer. According to actual measurements, the circumference of the presenting portion of the head, in labor, is from 12 to 13¼ inches; that of the breech, with both thighs flexed upon the abdomen, is from 12 to 13½ inches; that of the breech, with only one thigh flexed, the other being brought down, is from 11 to 12½ inches; and that of the hips, both legs being brought down, is from 10 to 11½ inches. So that it is much safer for the child, to accomplish version by one foot only. I was called, a short time since, to a case where a foot and arm protruded beyond the vulva, and no justifiable degree of traction could move the child, neither was it possible to return the arm. The waters had been discharged at an early period of the labor, the uterus acted energetically, and the accoucheur had not been able to find the other foot. Finally, after some attempts at changing the position of the fetus in utero had been made, he was enabled to pass his hand upward, when he found the leg across and at right angles with the presenting one; he carefully brought it down, and the child was delivered in a few minutes. In this case it would have been impossible to have effected the version by the one foot.

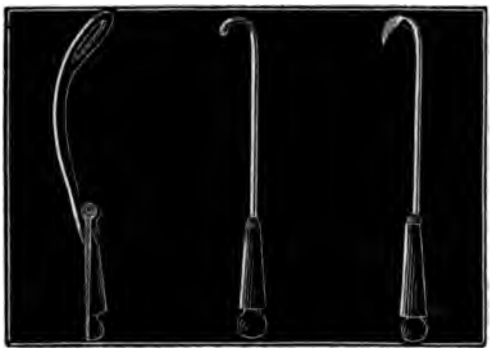
After the delivery, do not place the child too soon to the breast, but allow the mother a rest for some hours; pursue the means named on page 400, and be prompt to combat the first manifestations of inflammatory action.

The FILLET, is a strong piece of linen or ribbon, about three inches in width, and twenty-five or thirty inches in length, and has been recommended in breech labors, when the pains are not sufficient to complete the delivery. Its mode of application is to oil or grease it, and then, having rolled up some five or six inches of one end, pass it into the vagina, and by means of the fingers push it between the child's thigh and abdomen from one side to the other; then bring down the rolled-up end, as it passes from the side opposite to that at which it was first carried, and tie the two ends together. By this means, the fillet is secured across the thighs, so that traction may be made upon them, and which must always be done during a pain, acting in concert with uterine action, or the bearing-down efforts of the patient. It is very difficult to adjust the fillet, and, probably its use may be dispensed with altogether. A finger, or the blunt hook, passed between the hips and abdomen, may, with a prudent force, perform all that can be expected from the ribbon.

It is used, also, to secure the presenting hand in a shoulder presentation, when turning is attempted, and thus prevent it from rising and embarrassing the delivery of the head. It should be applied to the wrist.

The VECTIS, LEVER, or TRACTOR, is an instrument somewhat resembling one blade of the obstetric forceps. It consists of a steel blade fitted into a roughened handle of hard wood, the whole instrument being twelve or thirteen inches in length. The extremity of the blade is expanded like a forceps-blade—is furnished with a fenestra—and one side is so curved as to adapt it to the convexity of the head of the child. Sometimes it is made with a hinge for the purpose of carrying in the pocket, and again, it is made without a hinge, but having the handle to screw on the blade; both of these latter forms are objectionable. It is not necessary to enter into a minute description of the instrument, from the fact that very few obstetricians of the present day make use of it; in former times, however, it was much in vogue. (*Fig.* 63.)

FIG. 63. FIG. 64. FIG. 65.



VECTIS, BLUNT HOOK, AND CROTCHET.

The vectis has been recommended for the purpose of correcting mal-positions of the head, or of aiding its movements, whether at the brim, or in the pelvic cavity; it has also been advised as a tractor to aid in the delivery of the head. The rules for its introduction are somewhat similar to those for the forceps. The instrument should not be applied unless the os uteri is dilated and yielding, as also the soft parts, and labor-pains must likewise be present, or its employment would be attended with no success. Instead of being secretly used, as has been frequently the case, the patient and her friends should be acquainted with the necessity for interference, the same as in the use of the forceps, and which must never be attempted unless positively demanded. Then having emptied the bladder, and rectum also if necessary, place the female on her left side, or on her back, as the practitioner prefers—though in the latter position, it will be necessary to bring the hips over the edge of the bed, the same as when the forceps are employed. The operator will now pass three or four fingers of his left hand, as high up as possible within the vagina, over the head of the child, to serve as a director for the vectis—which, having been properly warmed and oiled, is to be carefully and slowly passed over the convexity of the fetal head, until the point is reached to which the force is to be applied. Then withdraw the hand to about the middle of the instrument, forming a fulcrum with it at that point; the lever is then of the first kind—the right hand acting on the handle by pressing it in a direction opposite to the one which it is desired the head should take. Sometimes, it is formed into a lever of the third kind, the right hand serving as the fulcrum or point of support, while the left, at the middle of the lever, gives to it the necessary movements.

It is frequently the case that the vectis will have to be placed on several parts of the head in succession, in order to reduce its mal-position and aid in its descent, and this may be accomplished by carrying the instrument gently over the circumference of the head, from point to point, without withdrawing it; and should any difficulty be present interfering with its application, no force must be employed to overcome it—if it can not be passed without rude measures withdraw the vectis, and reintroduce it. It may also be necessary to use it alternately as a lever, and as a tractor. When used as a tractor, both hands are to be employed in making firm, but not violent traction in the direction of the axes of the pelvis, according to the location of the head, and the efforts should be made only during the presence of a pain, ceasing during an interval, and slightly raising or loosening the instrument from the cranium. The least force sufficient for the purpose is the best. When the head is at the brim, the vectis must be applied over the occiput; when at the inferior strait, it must be introduced over the sides. The necessary changes may be effected by only three or four efforts, sometimes thirty or forty will be required.

At the present day, those who advise the vectis, limit its application to cases—where the head can not execute its motion of rotation in the pelvic cavity; in face presentations—applying it early in the labor over the occiput, making traction, while at the same time the chin is to be pushed up by the hand, for the purpose of bringing down the vertex; in presentations of the side of the head—and, likewise, in instances where the head does not advance, the pains being strong, and where there is only room sufficient for one blade to act. However, in nearly all these cases, the forceps, or a manual operation, will usually be found sufficient, and, should the vectis be required, one of the forcep-blades will be found fully adequate to effect all that can be accomplished by it. I should hesitate a long time before attempting to use this instrument on the head, above the superior strait.

In the hands of the unskillful or imprudent operator, the vectis may occasion serious results; thus, if it be introduced while the os uteri is not dilatable, nor sufficiently dilated, it will give rise to contusions, and laceration of the parts, and death of the mother. If it be rudely or carelessly introduced, the vagina or the uterus may be ruptured. If the traction be not made in the direction of the axes of the pelvis, as the situation of the head may require, not only will the female be seriously injured, but the operation will prove of no avail. If a portion of the uterus be engaged in the cavity of the blade, between it and the fetal head, a fatal injury may be the result. If the traction be made regardless of the pains, not only will the operation prove useless, but the female will be exposed to much danger. If the instrument be pressed upon the soft parts of the mother, they must suffer more or less from contusion. If too much force is applied as the head glides over the perineum, or if this be not supported at the time, a very serious rupture may be the consequence. Too much pressure with the point of the instrument upon the child, may occasion a troublesome wound.

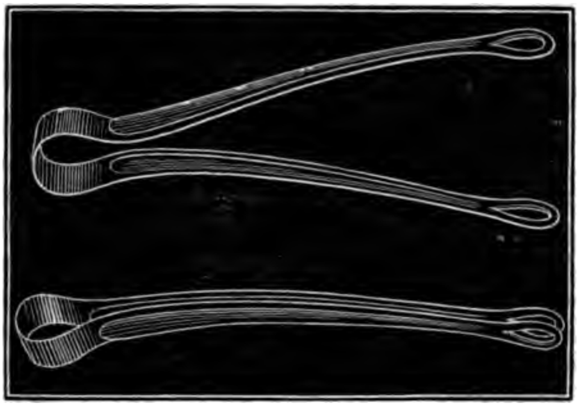
The Blunt Hook (*Fig.* 64) consists of a round rod of metal, curved at one extremity, and having the other fastened into a roughened handle of hard wood. Hodge's forceps (*Fig.* 67) are so arranged that either blade may be employed as a blunt hook; it may likewise be obtained in one rod without any handle, the extremity opposite to the blunt hook being formed into a crotchet. It is used in presentations of the breech, when delay in the labor renders it necessary to make traction, and the finger can not be introduced into the groin, or when the finger can not exert a sufficient degree of traction: it may also be used in those cases where it becomes necessary to pull down the feet, but which it is impossible to effect by the fingers. It is also occasionally employed in those cases where, the head having been delivered, the thorax, from its size, prevents any further advance of the labor: in these instances, it is passed into the axilla of the shoulder nearest the sacrum, to disengage this first. It has also been recommended as a substitute for the crotchet, when the cranial bones are so loose as to render it almost impossible to obtain a purchase upon them by the crotchet: the blunt hook may in these cases be passed behind an orbit, or into the foramen magnum.

This instrument is to be applied in a manner similar to that recommended for one blade of the forceps: it should be passed with its point directed toward the palmar surface of the hand by which it is guided, and when it has reached the point on which we design to have it act, give to it a rotary motion in the direction of its axis, and thus cause its free extremity to pass into the axilla or fold of the groin, being careful, in the latter instance, not to injure the genital organs of the child. After the blunt hook is applied, always examine and ascertain that it has been properly adjusted, and is in a position to effect no injury to either the mother or child.

When the groin cannot be hooked by passing the instrument in front of the anterior hip, this may be effected by introducing it between the thighs. An improper use of the blunt hook may give rise to serious difficulties.

Professor Cleaveland has invented a Placental Forceps which is extremely simple and of undoubted utility: they differ considerably from all others heretofore made, and are pronounced by those who have employed them to be superior to any others at present in use. They are made of a single piece or band of steel, bent in the center so as to form a bow, very much resembling the old-fashioned sugartongs. From this curve or bow, which serves as a spring for dilatation, the two arms extend—the whole instrument being about nine inches in length. The metal, at the curved part, is about three-quarters of an inch in breadth, perfectly flat, and the curve forms about three-fourths of the circumference of a circle whose diameter is one inch. The arms, between the bow and the blades, are made slighty convex on their external surface, in order to render them firmer, and capable of being more readily introduced within the uterus. The blades are somewhat broader than the arms, being about three-quarters of an inch broad, ovoid, with the base forward, slightly convex, and with an ovoid fenestra to allow a portion of the soft structure of the placenta to pass through and thus obtain a firmer hold of it, as well as to present a broader surface to the tender tissue, that it may be less liable to tear or rupture.

Fig. 66.



Prof. C. H. Cleaveland's Forceps.

The blades, like the arms, are slightly convex externally, concave internally, and when closed together, they present a flattened amygdaloid shape, about three-fourths of an inch broad by one-third of an inch in thickness. When they are closed, the arms are parallel and near each other, but not quite in contact. The arms are somewhat bent on one of their edges or margins, so as to correspond with the axis of the pelvic cavity; or they may remain straight, according to the fancy of the purchaser.

The mode of application is, to introduce the index finger of the left hand into the vagina, with the point of it resting just within the os uteri; then, with the blades closed, pass the forceps along the palm of the hand and the palmar surface of the finger, within the cervix uteri, and when it has entered an inch or [illegible]he blades to open gradually, and produce as much dil [illegible] may be necessary to admit the ready exit of the placenta. When this is effected, the forceps are to be gently carried forward, with the blades still open, so that they will pass between the placenta and the uterine parietes, until they embrace the body of the cake, when they must be closed and the after-birth be carefully removed. The advantages possessed by these forceps are:—they have no joint to pinch the vulva, or vaginal walls, or into which the capilli of the parts may be caught. The blades and arms are perfectly smooth on both surfaces, and their axis accords with the axis of the pelvic cavity, which is not the case with any other instrument used for this purpose. As soon as the instrument has passed within the cavity of the uterus, its arms open and produce dilatation, so that there need be no traction made on the organ. The blades are sure to pass between the placenta and the uterine walls; and the fenestra allows a broad, firm hold on the cake, without the danger of tearing it, which is apt to follow the use of a narrow, rough blade. (*Fig.* 66.)

CHAPTER XLII.

THE FORCEPS.—DAVIS'S FORCEPS—HODGE'S FORCEPS—CASES IN WHICH TO BE USED—CASES IN WHICH NOT TO BE USED—PERIOD FOR USING THEM.

FORMERLY, when there was any delay in the advance of the presenting part of the child, from whatever cause, it was the custom to insert a hook into the eye or some other part of the child's head, and then apply extracting force; consequently, but few children were saved, and those who did live subsequently, were more or less disfigured or mutilated. Such an operation must have been repugnant to every feeling and conscientious man, causing him to postpone its performance as long as possible, and which delay would necessarily add to the hazards of the mother.

But the invention of the forceps has relieved the obstetrician in a great measure of these unpleasant operations, while at the same time it has been, and still continues the means of saving the lives of numerous children, as well as mothers. The forceps were invented in the sixteenth century, prior to 1647, by Dr. Paul Chamberlen, who, together with his sons kept it secret until some time in the early part of the seventeenth century, when it became gradually known to the profession. However, it had been employed by Solinger in Germany, and Palfyn in France, for some time before it became generally known what the instrument was, or who was its inventor. Since its introduction the original instrument has undergone various modifications, some of which are less objectionable than others, or, perhaps, are superior only in certain cases. It is unnecessary to enter into a detailed history of the invention and introduction of the instrument, or to describe the many changes through which it has passed; for such information, there are various works to be readily obtained, which contain all the particulars, and which those who are curious in this matter may consult. The limits of this work will not permit more than a close adherence to the practical and useful.

The obstetrical forceps is composed of two arms or branches, each of which has three distinguishing parts: 1st. the *cochlea*, blade, jaw, or clamp, which is shaped somewhat like the bowl of a spoon, and the concavity of which is intended to be applied on one side of the child's head; 2d, the *junctura*, joint, lock, or hinge, at which point the two blades articulate with each other; and 3d, the *manubrium*, or handle—which should be of sufficient length to enable the accoucheur to operate with facility. The blade of each branch has an opening or fenestra, which lessens its weight materially, beside having the advantage of allowing the parietal protuberance to pass out beyond them, when applied over the sides of the head, and thus lessening the diameter which would be presented, were the blades solid; each blade is curved in the direction of its longitudinal axis, as well as in that of its transverse, which enables the instrument to be more readily introduced and acted upon in the direction of the pelvic axis. The joint in each blade varies, one being furnished with a pivot and the other with a notch or mortise; when the two are properly united, the blades are firmly locked. To distinguish the blades from each other, the one with the pivot is termed the *male blade*, and that with the mortise, the *female blade*. The handles are similar in each, having a curvature externally, which not only admits of their being firmly grasped without slipping, but also serves to fulfill all the purposes of a blunt hook.

There are two descriptions of forceps in general use, *the short* and *the long;* the former were more in vogue some years ago, but since the excellent improvements made in the long forceps by Prof. Hodge, it is coming more into favor — because, while it possesses all the benefits of the short forceps, it has an advantage in its applicability to operations at the brim, when these are required. The short forceps are only useful when the head is at or near the inferior strait.

Nearly every obstetrician has some favorite model of this instrument; but among the short forceps, I believe those of Prof. Davis, of London, are more generally preferred by the profession in this country. Prof.

Meigs, who has adopted them, gives the following description:—"It weighs ten ounces and three quarters, and is in length twelve inches: its lock is the English lock, composed of a notch in the upper surface of the left and in the lower surface of the right hand branch. When the handles are closed, the ends of the clamps are seven-tenths of an inch apart, while the fenesters, at their widest part, are two and three-quarter inches asunder. The broadest part of the fenester is equal to two inches, while its whole length is five inches. From the extremities of the handles to the lock or point where the branches cross, is four and a quarter inches. After the branches are crossed, they do not divaricate, but proceed in parallel lines one inch and a quarter; hence, if a fetal head be ever so considerably elongated by the pressure of the parts, the clamps are sufficiently capacious to contain it, being seven inches long. In this instrument, such are the width and length of the fenestræ, that a large part of the parietal protuberances jut out through or beyond them when they are fixed on the head." ° ° ° "Its interior face is perfectly adapted to the rotundity of those parts of the head which it touches; while the fenestræ are so vast as to permit considerable portions of the parietal protuberances to project as segments of curves outside and beyond the fenestral openings. It would be true to say, that the instrument, when accurately adjusted upon the sides of the cranium, scarcely touches the maternal tissues within the pelvis. The exterior curves are also arranged so accurately that the tissues of the mother can never touch the edges of them; so that they can not be cut by them, the surfaces of contact being everywhere broad and gently rounded. The admirable form of the old-curve or head-curve, enables the instrument to touch very large portions of the cranial surfaces, pressing them equally, and not unequally; so much so, indeed, that, when the instrument is accurately applied, it would be a very difficult matter to do with it the least injury to the fetus, since it can scarcely slide."

But, however useful the above forceps may be, it is a matter of considerable moment to so simplify all our instruments, that one only of them may be adapted to the accomplishment of several purposes; and this is more especially necessary in obstetrics, in which it frequently occurs that delay, even of a short interval, is attended with serious results. On this account Hodge's improved long forceps are more usually preferred than others, not only because of their lightness and their correct form and adaptation to the purposes for which they are intended, but likewise because they combine the utility of the short forceps, the long forceps, the vectis, and the blunt hook. It is the one which I prefer, and which I recommend to the classes attending the Institution in which I occupy the obstetrical chair. This instrument is a modification of the long French forceps, and is described by Prof. Hodge himself, as follows:

"The great object of the forceps is to extract the head of the fetus from the mother's organs, in suitable cases, without injury to the mother or child. It is notorious that injuries to one or both parties frequently result, exciting a too well-founded dread of this instrument in the minds of females, and even of physicians. Many causes contribute to this unfortunate result. No doubt much depends on the size, weight, and especially on the form of the instrument employed, a fact confirmed by the almost innumerable varieties which have been suggested. The instrument, as heretofore used, is evidently imperfect; and the one now suggested, is presented under the impression that, while it maintains all the excellencies of the former varieties, the injurious influences are partly, if not wholly, avoided. It is a modification of the long French forceps, but may be well termed an eclectic forceps, as combining, as much as possible, the peculiar excellencies of the English, German, and French varieties.

"The advantages of the French or long forceps are, I think, many and decided, as, 1st, by them, any operation pertaining to this instrument, can be performed. There is no necessity to vary the form, structure, or size, of the instrument, whatever may be the presentation of the head, its position, or its location. 2d. By them, sufficient power can be applied in cases of necessity, which can not be done by the short forceps. Their leverage is greater. 3d. The narrowness of the blades, which, without detracting from the utility of the instrument, will allow of their application to the sides of the head; even in oblique and transverse positions. Many of the modern English forceps, are too broad to allow the proper manipulation of the instrument in the cavity of the pelvis. They can not be introduced through the vulva without pain, especially in first labors. The French forceps can very generally be applied without pain.

"4th. It may be added as another advantage, that as habit in the use of an instrument is all-important, the practitioner will sooner become accustomed to a forceps which he can employ on all occasions, than when he is obliged to vary it continually; especially when it is remembered that among the strong and well-formed females of America, cases for the forceps are not very numerous in the circle of any practitioner.

"The disadvantages, which experience has taught me arise from the French forceps, are:

"1st. Its unnecessary weight.

"2d. The pelvic curve, in the variety most in use in this country, is not sufficiently great. Hence when the head is high in the pelvis, the perineum will be too much pressed upon, or else the blades will be applied in the direction of the occipito-frontal or longitudinal diameter. instead of the occipito-mental or oblique diameter.

"3d. The divergence of the blades commencing at the joint must necessarily distend the vulva (especially its posterior margin) prematurely, and when the head is high up, gives pain and endangers the laceration of the perineum.

"4th. The small size and kite-like shape of the fenestra prevents any portion of the cranium, even of the parietal protuberances, projecting into their openings: hence the hold on the head is less firm. and space is occupied by the blades, the thickness of which is added to the transverse diameter of the head.

"5th. The flatness of the internal or cephalic surfaces of the blades, so that the margin of the fenestra, often measuring three-eighths of an inch, is much thicker than the external edge of the blade, increases the space occupied by the instrument. Hence in cases of difficulty, where compression is employed, contusion or even wounding of the scalp results.

"6th. The mode of junction of the French forceps is decidedly inconvenient when compared with the English, and especially with the German mode.

"These disadvantages I have endeavored to obviate without diminishing or circumscribing the utility of this most valuable instrument, to which the profession and the public are so much indebted. My experience encourages the hope, that the attempt has been in a very great degree successful, so that even in inexperienced hands, the dangers of the forceps have been materially lessened.

"1. The weight of the instrument has been diminished from twenty ounces, avoirdupois, to seventeen ounces.

"2. The pelvic curve has been slightly increased, so that the perineum may not be dangerously pressed upon when the blades are in the axis of the superior strait. To counteract any loss of power which may ensue from the increased curvature, there is an angular bend in the handles, in an opposite direction, that the direct line of traction may be preserved, a suggestion of our skillful and experienced instrument-maker, Mr. Rorer.

"3. The shanks or commencement of the blades are nearly parallel, diverging no more than is absolutely necessary, until they approximate the head of the child, when a more rapid curvature, than in the Levret forceps, occurs.

"4. The proper blades of the instrument, from the shanks to the extremities are nearly of the same breadth throughout, being equal to that of the extremity of the French forceps.

"5. The advantages are a more secure hold of the head, and especially allowing larger fenestræ, so that the parietal protuberances may project into the openings, and no space be occupied by the blades, when properly applied.

"6. The cephalic surface of the blade is concave, so as to be adapted to the convexity of the head, as suggested by Dr. Davis in his improved forceps, hence no edges touch the scalp, and there is no wounding of the tissues, even when great compression is made.

"7. The very ingenious and scientific mode of locking the blades, as in the German or Siebold's forceps, by means of a conical pivot, and the corresponding oblique conical opening for its reception, is adopted, by which all the facilities of the English junction are enjoyed, and the security and firmness of the French joint are maintained.

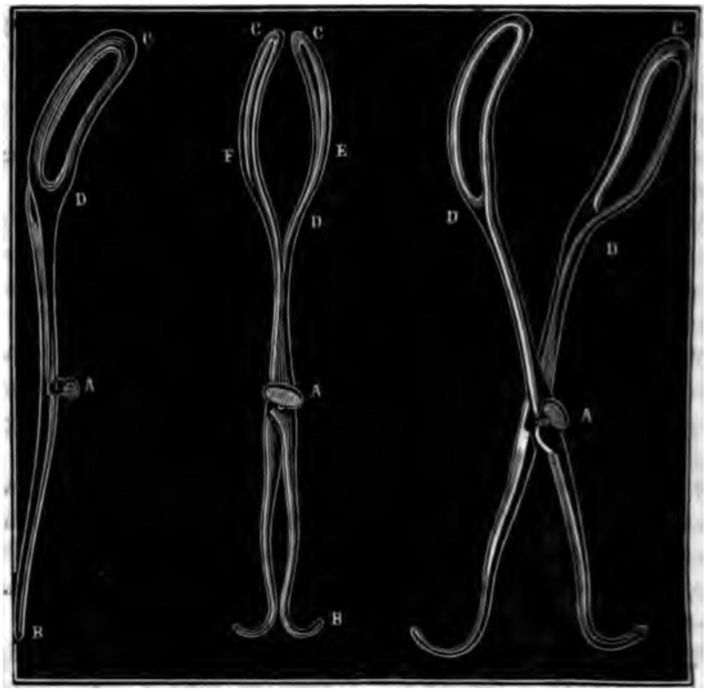
"The eclectic forceps weighs one pound and one ounce, being nine ounces lighter than the French forceps, as usually manufactured by Rorer, of this city, and eleven ounces lighter than a specimen of Dubois forceps in my possession, made in Paris.

"The whole length of the instrument (*Fig.* 67) in a direct line from *b* to *c* is 16 inches; from the joint *a* to the extremity *b*, the length of the handles, is 6·8; from *a* to *d*, length of parallel shanks, is 3·5; from *d* to *c*, the proper blades in a direct line, is 6 inches; from *c c*, the extremities, to *e f*, the greatest breadth, 3·7 inches.

"The separation between the points *c c*, when the handles are in contact, is ·5 of an inch; from *e* to *f*, the greatest breadth when the handles touch, is 2·5; when the separation at *e f* is 3·5, the points *c c* are separated to two inches; the breadth of the blade is 1·8, slightly tapering to 1·7 near *c c*, the extremities. The breadth of the fenestra is 1·1; the thickness of the blade is ·2 of an inch. The perpendicular elevation of the points *c c*, when the instrument is on a horizontal surface, is 3·4 inches, which indicates the degree of curvature of the blades.

"The elevation of the handles near the point, above the same horizontal line, is 1·3 (including the thickness of the blades), which indicates the extent of the angular bend in the handles."

FIG. 67.



HODGE'S FORCEPS.

It is sometimes the case that the head is delayed in its descent in consequence of its bi-parietal being slightly larger than the antero-posterior diameter of the superior or inferior strait; in such instances, the instrument of Prof. Hodge may be applied along the sides of the head, and sufficient compression be made upon this diameter to ensure its passage through the brim, and into the pelvic cavity, or through the outlet. Too much compression, however, will destroy the child, and this should always be kept in mind when operating.

From experiments instituted by Baudelocque, upon several still-born children, as to the amount of compression which the fetal head will safely bear, he found that the degree of reduction which the diameters may harmlessly undergo, is very inconsiderable, not exceeding four and a half, or five lines; that the extent of the reduction depends much upon the more or less perfect ossification of the cranial bones, and the ratio of closure of the sutures and fontanelles, and that it can not be properly estimated from the amount of force employed in approximating the handles, nor from the distance remaining between them when they approximated in delivering the head.

Prof. Meigs most emphatically pronounces the forceps to be *the child's instrument*, and *not the mother's*—that it is by no means to be viewed as a *compressive* instrument, but always as an *extractor;* a declaration which should never be forgotten by the obstetric operator.

However, it may be proper to state, that there are many accoucheurs who, though recognizing the correctness of Prof. Meigs' remarks on this point, as a general principle, yet consider that there may be some exceptions, as in moderately contracted pelves, in which a gradual compression of the head may effect delivery, without evil results to either the child or its mother. Among them I may name Dr. Rigby, who says: "The slow and gradual pressure of the forceps thus exerted (by tying the handles together and tightening them after every successive effort), upon the head of a living fetus, will have a very different result to that of the experiments of Baudelocque and others, in attempting to compress the head of a dead fetus, by the application of a sudden and powerful force." So that from these remarks, it may be well to consider the use of the forceps as a compressor, above the brim, either when its diameters are slightly diminished, or the bi-parietal of the head somewhat augmented, as mere *exceptions* to the general rule, *that the forceps are not intended for compression.* And when compression is made, it should never be in the direction of the occipito-frontal diameter, but always in that of the bi-parietal, as being less likely to injure the child. Judicious management will frequently render a resort to the perforator unnecessary.

In some countries the forceps are employed much more frequently than in others; thus, according to Churchill, in 52,268 cases of labor occurring in British practice, the forceps were applied in 144 cases, or about 1 in 362¾. In 44,736 labors in French practice, they were used in 277 cases, or about 1 in 162; and in 261,224 labors in German practice, they were resorted to in 1,702 cases, or about 1 in 153½. The whole amounting to 358,228 cases of labor, in which the instrument was applied 2,123 times, or about 1 in 168½. The results to the mother in British practice, was 1 death in 20½ cases; to the child 1 in 4½. In French and German practice, one mother was lost in 13½, and about one child in five. As the result to the mother has not been named in many instances, nor the peculiarities of each case given, these statistics can be considered as only approximative. In our own country, the statistics have been too meager and limited to enable us to form any idea of the comparative frequency of forceps-labors, or their results.

The cases in which a resort to the forceps has been advised, are the following—recollecting, however, that the short forceps are never to be used when the head has not passed the superior strait:

1. To effect delivery in cases where the uterine contractions are weak and inefficient, and cannot be aroused by the ordinary means. Nor should they ever be applied, unless we are fully satisfied that the natural powers are inadequate to effect the delivery without hazard to the mother or child. Thus, the head may be in the superior strait, not impacted, but making no advance in consequence of the inefficiency of the pains; here, the long forceps have been advised to assist in accomplishing the descent. Or, the head may present at the brim, in a mal-position, which, not being corrected by the pains, as well as being incapable of reduction by the hand, may be rectified by the long forceps, provided the os uteri be in a proper condition.

In the use of the long forceps, I would remark here, that when employed at the superior strait, the blades are to be introduced in the transverse diameter of this strait, so that a blade will be within each ilium; while both the long and short forceps, are to be introduced over the sides of the child's head when it has entered the pelvic cavity, a blade being over each ear—and which rules must be borne in mind when the long forceps are employed as a substitute for the short ones.

2. To hasten delivery when dangerous symptoms to the mother are present, whether from too prolonged labor, hemorrhage, convulsions, exhaustion, rupture of the uterus when the head is within reach, or from resistance of the muscles of the perineum.

3. To save the child's life in some face presentations, and in the occipito-posterior positions when the forehead is behind the pubic symphysis. This, however, is not necessary in all instances of the above character, as delivery frequently terminates by the natural efforts, though more slowly, and with a greater amount of suffering than in ordinary cases.

4. To preserve the child in prolapsus of the cord, when the pulsations grow weak.

5. When there is a detention of the head within the pelvic cavity, heretofore referred to when speaking of the compressive action of the instrument.

6. When an extremity descends with the head, and can not be returned, the augmentation of the diameter within the pelvis, may require a greater degree of expulsive force than can be given by the natural powers.

7. In breech labors, when there is a delay in the advance of the head, the body and extremities having been delivered, the child may die, unless it be removed by the forceps.

The forceps are *never to be employed* when the os uteri is rigid and undilatable, or relaxed but not sufficiently dilated; when the soft parts are inflamed and swollen; when the diameters of the pelvic cavity are diminished by the presence of tumors; in deformities of the pelvis; when the child is dead; and when the fetal head is hydrocephalic, or firmly ossified. Neither is it to be applied to the breech. And unless there exists some urgent reasons for their use, as hemorrhage, large head, small pelvis, convulsions, etc., they are never to be employed except the pains are inefficient. Indeed, the instrument should always be considered the "child's instrument," and a substitute for absent or inefficient expulsive force of the uterus; and, under no circumstances whatever, is it justifiable to employ them to save trouble, or in any other way accommodate the convenience of the practitioner.

When the uterus acts energetically, the pulse not being over one hundred beats in a minute, the countenance natural, the spirits good, the tongue and mouth moist and clean, the abdomen and soft parts free from pain on being pressed or touched, and the head makes the slightest advance, no interference is required, notwithstanding the labor may have continued over twenty-four hours.

If attempts be made to introduce the forceps before the os uteri and soft parts are in a favorable condition, rupture of the uterus, or laceration of the perineum and vagina may be the consequence, and which, when occurring, always proves more or less hazardous to the mother. Nor is it proper to carry the forceps within the os uteri, until it has so far risen above the parietal protuberance that it can not be felt.

When the soft parts are swollen and inflamed, a condition which will seldom occur in the hands of a careful accoucheur, it will be inexpedient to use the forceps, because of the disposition to sloughing of the parts under such circumstances, and, therefore, the perforator will be the safer instrument for the mother. The same course will be pursued in diminished pelvic diameters from tumors, deformities, or other causes. In these cases the child must be sacrificed for the safety of the mother—this is a fundamental principle of obstetrics. Generally, in instances where the perforator will be required, the pressure will destroy child, before the symptoms become so threatening as to induce a obstetrician to operate.

When the child is known to be dead, which may generally mined by the stethoscope, the perforator is advised in prefer forceps; and this is likewise recommended in hydrocephalic heads, to be used, even before the child's death, if the mother requires it.

As the instrument is intended for the head only, it could not be applied to the breech with any degree of safety or success; but would be very apt to tear or mangle the soft parts of the breech and trunk upon which it might be exercised. But it may be frequently used with advantage to extract the head, after the body of the child has been expelled, when any difficulty or delay occurs in its delivery.

In impacted or locked head, the perforator will generally be required on account of the impossibility of moving the head with the forceps; this condition of the head is usually connected with a small pelvis, or a large and perhaps ossified head. But in cases where there is a mere arrest of descent, from a close fitting of the circumferences of the head to those of the pelvis, the forceps may be used. (*See note, page* 357.)

In all cases where the head is considerably larger than the pelvis, the forceps, as well as a resort to turning are improper; and either the perforator or the Cesarean operation will be required. Yet, as our means of accurately determining the size either of the head or of the pelvis, are not always absolute, it is never improper to attempt the delivery by a careful and gentle employment of the forceps. It will frequently happen that when the antero-posterior diameter of the brim has not reached three inches, the forceps may be successfully used.

The PERIOD FOR OPERATING, will depend entirely upon the circumstances attending each individual case. Previous to the rupturing of the membranes, the employment of the forceps will be unnecessary; but after their rupture, in ordinary cases, we are to be guided more by the constitutional symptoms than by a mere lapse of time. There is one exception to the statement just made, and that is when the difficulty is at the superior strait, and the head can not descend through it, in this case, as too great a delay may give rise to serious symptoms. the second stage may be considered to have commenced as soon as the os uteri is fully dilatable. The general rule upon which to act, is, not to interfere until the second stage of labor has continued for twenty-four hours without delivery having been accomplished. But, although as a general rule, this is entitled to much attention, it frequently occurs that symptoms present themselves before the twenty-four hours have expired which demand interference; and, again, many females will sustain a prolonged and painful labor, with more fortitude, and less prostration of the system, or other unfavorable symptoms, than others. We must. therefore, be governed *principally* by the symptoms, and *partly* by the lapse of time, being careful not to delay too long, or until the parts become dry and inflamed, and the labia and perineum become infiltrated with serum, for then, laceration and sloughing will almost inevitably ensue. If the head remains arrested for four hours, we are justified in operating even though no unfavorable symptoms exist, because by so doing we preserve the integrity of the soft structures.

In the selection of the proper period for operating with the forceps, in connection with what has already been stated, an attention to certain circumstances, will materially assist us. Thus—if the health of the female has been impaired, or if she has previously suffered from a long-continued sickness, the powers of the system will be less likely to sustain her under a lingering labor, or to terminate the delivery, than when she has been in the possession of good health; though we often meet with females laboring under consumption, dropsy, etc., whose labors are as vigorous and natural as those of the most healthy and robust. If the female has previously given birth to children, there is a greater reason to suppose that the present one may also be born without aid, unless there exist a mal-position or abnormality of the head.

If twenty-four hours have elapsed since the commencement of the second stage of labor, the forceps will very probably, be required, but we should not be too hasty, even then, in their application, being governed, in a great measure, by the symptoms present. Yet we must remember that if the head remains stationary, pressing upon the soft parts for four hours, their structure becomes much endangered. But "if the head advances ever so slowly, the patient's pulse continuing good, the abdomen free from pain on pressure, and no obstruction to the removal of urine," the strength and spirits of the patient being also good, interference, as a general rule, is not required, unless the child be dead. The mortality to the mother and child, in cases where this rule has been applied, is less, than among those where the forceps have been resorted to, and, it must also be borne in mind, that the death of the child alone does not justify any interference, unless there be sufficient cause aside from this fact.

The condition of the patient's strength, and her capacity of endurance must also be taken into consideration; and we must be careful not to be misled as to the exhaustion of the female. The uterus may be acting energetically, and the woman be walking about the room, and yet she will complain of being exhausted; the practitioner must be guided by other symptoms than merely such expressions. When exhaustion is present, the pulse will be very quick, over one hundred beats in a minute; below this there is seldom any danger. The pains, also, gradually become weak, with lengthened intervals, and finally cease; and accompanying this condition there will be a greater or less discharge from the vagina, of a faint, unpleasant, but not putrid odor, and of an olive color, and which is, probably, the secretion from the lining uterine membrane, changed in consequence of the long-continued and powerful exertions of the organ; this may be considered one of the first manifestations of exhaustion. The countenance of the patient assumes an anxious appearance, the cheeks become pale, sallow, or spotted, the eyes sunken and dull, and the tongue will be dry and loaded either with a brown sordes, or, if fever is present, with a white fur. The respiration is also hurried, and other unfavorable symptoms may appear. Vomiting of a dark fluid having the appearance of coffee-grounds is most generally present, when exhaustion has advanced; and when a long period has been allowed to elapse, a shivering, coldness of the extremities with cold, clammy perspiration on various parts of the body, and delirium come on, indicative of great local injury and extreme danger.

The condition of the abdomen, and of the soft parts, will also indicate the period for operating. Thus, if there is tenderness of the abdomen on pressure, inflammation is to be dreaded, and delivery will be the safest course to pursue. If the soft parts, instead of being cool, soft, and moist, become dry, hot, swollen, and painful, so that the least touch can scarcely be allowed, it has been advised by some writers to deliver by the forceps; but from the tendency to sloughing in such cases, I do not deem it the best practice. Still, an attempt to subdue the tenderness and inflammation by the application of fomentations may be undertaken in such cases; always, however, recollecting that the danger increases in proportion as the pressure is continued. To wait, however, for the appearance of vomiting of dark fluid, of cold shiverings or sweats, hurried breathing, delirium, or swelling and inflammation of the soft parts, would be extremely injudicious.

In all these protracted cases of labor, great vigilance is required that we do not delay the operation so long as to endanger the life of the mother; and if there is a chance for saving the child's life without any injury to the mother, the delivery may be undertaken even before those symptoms appear which indicate a failure of the powers of the system. There is always a greater possibility of injury from too long a delay, than from interfering a little too soon.

Occasionally circumstances will exist which demand the use of the forceps for delivery before the rupture of the membranes: in such cases, if the os uteri is in a favorable condition, (and positively not without), the membranes may be artificially ruptured and the instrument applied. Such instances are, fortunately, very rare.

The principal dangers to which the mother is exposed when the forceps are used, are [illegible]n of the vagina, or of the perineum, or of both; laceration of the cervix; and contusion of the soft parts. The child may have its head too much compressed; its scalp, or ear, may be bruised or torn; and the pressure may induce paralysis of the facial nerve.

CHAPTER XLIII.

RULES FOR APPLYING THE FORCEPS.—MODE OF APPLYING THE FORCEPS IN THE VARIOUS POSITIONS OF THE HEAD.

BEFORE stating the manner of applying the forceps, I will briefly recapitulate a few of the general principles referred to in the previous chapter, and which should be constantly kept in view by the accoucheur.

1. When the powers of nature are sufficient to effect the delivery, interference is not required, unless circumstances occur which threaten the life of the mother.

2. The forceps, acting as a substitute for the natural efforts, are to be employed as an extractor, and not as a compressor.

3. They are never, under any conditions whatever, to be used, unless the os uteri is sufficiently dilated and dilatable.

4. They may be used when a delay in the delivery would endanger the child's life, but never at the expense of injury to the mother.

5. Under ordinary circumstances, they should not be applied until the symptoms of exhaustion commence; neither delaying too long until the more severe symptoms come on, nor operating too prematurely.

6. They must not be used when the soft parts are inflamed or swollen, on account of the tendency to subsequent sloughing; neither must they be applied to any part of the child except the head.

7. The lateral motion or oscillating movement from handle to handle must not be allowed to take too extensive a range; and remember, that the higher up the forceps are passed within the pelvic cavity, the more limited will be the extent of these motions, and greater attention will be required not to injure the maternal soft parts.

8. Always avoid hurrying the head through the inferior strait, and fail not to give support to the perineum as it becomes extended by the advance of the head.

Previous to the introduction of the forcep-blades, the patient, as well as her friends, must be made acquainted with the character of the operation, and the necessity for it; for it is not to be supposed that any physician would attempt an operation of this kind, without the consent of the patient or her relatives. It may, likewise, be a judicious measure, in cases where imperative haste is not required, to show the instruments and explain their method of operating,—remarking that, as the hands cannot be applied to the sides of the head to assist in its delivery, these are employed as substitutes; and that, in the hands of a careful operator, they will not be apt to cause injury to child or mother. Whenever it is possible to procure the presence of another accoucheur with whom to consult and share the responsibility, it should be done, and will be found a very judicious measure.

Consent having been obtained, the bladder must, in every instance, be evacuated, either naturally or by catheter; and if the rectum has not been recently emptied, or if there be an accumulation of feces, an injection should be administered. But should the injection fail to clear out the rectum, and the symptoms demanding delivery are urgent, the practitioner may proceed to the application of the forceps, having, however, been careful to empty the bladder.

The practitioner, having turned up his coat sleeve and shirt wristband, and also protected his dress from being soiled, by an apron or something to serve a similar purpose, will have the female brought to the edge of the bed, lying upon her back, as in the position for turning, her feet resting on two chairs, separated sufficiently from each other to permit him to sit or stand between them, and her limbs are to be supported by two assistants, (not necessarily professional friends) who are to sit with their backs toward each other. The patient's hips should be brought so far beyond the edge of the bed, that no obstacle will be offered to the introduction of the forceps, or the free use of them after having been applied.

In order to prevent the floor from being soiled by the discharges, some cloths should be placed upon it immediately under the hips of the woman, and that part of the bed on which the inferior portion of her body rests, should also have several folds of blankets or other suitable articles placed there, to protect the bed from the discharges. The female should never, under any circumstances, be exposed: a sheet or blanket, according to the condition of the weather, should be thrown over her. And in order to facilitate the introduction of the blades, lard or some other unctuous substance should be freely applied to the soft parts.

These preliminary measures having been attended to, and the operator *knowing the exact position of the head*, he may sit or stand, as preferred, and proceed to introduce the blades. These, having been previously warmed to a temperature equal to that of the patient, by placing them in warm water, are to be well greased, and each blade is to be held in its appropriate hand, somewhat similar to the manner of holding a pen, although rather more firmly,—or it may be held in the manner of a bistoury while making an incision. Generally, the male blade, or the one introduced by the left hand, is applied first, then the other; and the introduction should invariably be effected during the absence of labor-pains, ceasing all efforts when these return.

Some writers advise that blade to be introduced first which is applied along the posterior part of the cavity, and this will probably hold good in a number of cases; but, as a general rule, it will be found better, in practice, to introduce that blade first which is the least easily applied, always being careful to so apply them that they will readily lock.

Having carefully passed in two or three fingers of the hand not occupied in holding the blade, and insinuated them between the os uteri and the fetal head, both as a guide for the application of the blade, and to prevent the os uteri from being included in the grasp of the forceps, each blade is to be successively and carefully passed over the sides of the head. If the head is high up, it will then be necessary to introduce the whole hand within the vagina, for the purpose of properly guiding the blades; and the direction of the axes of the pelvis, should not for a moment be lost sight of. Each blade must be passed inward with a waving motion, but without any force, and must also be kept in constant contact with the head during the introduction. Should either blade meet with any obstacle to its advance, it must not be forcibly thrust forward, but should be passed beyond the difficulty by careful and adroit management, withdrawing the blade, if necessary, for a reintroduction; should any force be employed to overcome the resistance, the ear, or a fold of the skin, or the soft parts of the mother, would, probably, be torn, and which would reflect much discredit on the skill and attainments of the operator.

As a general rule, the forceps are to be applied with their concave surface grasping the sides of the head in the direction of the occipito-mental diameter; and they are always to be so applied, that at the termination of the delivery, when the head is emerging from under the pubic arch, *their concave edges will be brought under and facing this arch.* By considering for a moment, whether the occiput or forehead is to be brought under the pubic arch, the practitioner can not fail to properly apply the instrument, for the concave edges of the blades must always be directed to that part of the head which passes under this arch, as it emerges from the outlet.

After the first blade has been applied, it may be held by an assistant until the second one has also been applied, which latter should be introduced above the male blade, in order that they may lock readily. If they do not lock easily, and without force, no rude or violent attempts at twisting or wrenching them round should be made, but the female blade should be removed and re-introduced, and it were better to repeat this several times than to attempt an adjustment by force. Occasionally, it may become necessary to withdraw both blades, and reapply them. When properly locked, a finger should be passed around the lock to ascertain that no portion of the soft parts, or of the genital hair, are fastened within it.

Having effected the locking, and removed any hairs, etc., which may be found entangled within the lock, screw down the pivot, by giving it two or three turns, grasp the handles firmly and make slight compression and traction, to ascertain that the instrument is firmly applied, and that no part of the vulva, vagina, or os uteri is included; and which latter circumstances may be known by the violent pain produced—when a withdrawal and readjustment of the instrument will be necessary.

The forceps being properly applied, the operator may now proceed to deliver. Seizing the handles with the right hand, he will hold them together with a sufficient degree of firmness to prevent their slipping from the head, and without exerting an undue compression upon it. The left hand must be applied over the lock of the forceps, with the index finger extended so as to touch the vertex of the child, and thus enable him to ascertain whether the head advances or not with the motion of the instrument. If it does not advance, the finger will be found to leave the vertex as the operation proceeds.

If the handles are held in the left hand, the right should be applied as above, to the lock; and the middle finger of the hand at the lock, may be placed in front of it, that is, on the part facing the child's head, to aid in the extraction, should more extractive force be required. The index finger must not be removed from the head until it emerges from the vulva; and should it leave the head, the operator must cease action, lest the blades suddenly slip off, and perhaps, occasion a serious injury to the parts.

The traction should always be made in the direction of the axis of that part of the pelvis, at which the head is successively placed, and must be made only during a pain, ceasing in its absence; or, should the pains have become entirely suspended, the operation should be continued only for two or three minutes at a time, requesting the female to bear down while acting, if she does not do so naturally, allowing intervals between each effort, and thus imitating, as closely as possible, the course pursued by nature. During the intervals relax the handles, and relieve the head from pressure.

In accomplishing traction, the impulse of the force employed, although guided in the direction of the pelvic axes, successively, is effected by a lateral motion, from handle to handle, keeping the instrument at first, as far back to the perineum as possible, in order to act in the direction of the axis of the pelvic brim (if this be necessary), and elevating the handles as extension ensues and the head emerges from under the pubic arch. About two-thirds lateral force, and one-third extractive force should be given; and the nearer the head is situated toward the brim, the more limited will be the extent of the motion from side to side, while at the outlet a large sweep may be taken.

Most usually the rotation of the head occurs with its descent, carrying the forceps along with it as it rotates, without any effort of the practitioner. But should this motion of rotation not be effected naturally, it must be accomplished by the operator, not by violent exertions, nor by twisting the head, but by continuing the tractions from handle to handle, at the same time slowly and gradually giving to them the proper direction in which the head must rotate.

This lateral extractive motion causes the instrument to act as a double lever, and in effecting the change in the motion from side to side, the operator must be very careful to retain every fraction of an inch which the head advances, not allowing the advance made by one lateral extractive movement to recede when he carries the handles in an opposite direction. Should the contractions of the uterus come on powerfully, and the head commence advancing naturally, after a few motions of the instrument, the rest of the labor may be left to nature; but the forceps must not be removed until the head is delivered, because, if, from an erroneous view of the natural efforts, the removal of the blades has been premature, requiring a subsequent re-application, it places the operator in a very discreditable and mortifying position.

As the head passes over the perineum, this must be carefully supported by an assistant, and the operator should slowly and carefully deliver the head, requiring the patient to lie still, lest any sudden movement on her part, might cause a severe laceration of the perineum. Generally, when the head reaches the outlet, it will occasion tenesmus and sufficient contraction to terminate the delivery, without any further efforts at traction, and all required of the operator will be to gradually carry up the handles of the instrument in front of the pubis, and thus favor the movement of extension; improper traction at this time will almost always cause a rupture of the perineum. But should there be any difficulty in the advance and extension of the head, a moderate degree of traction will then become necessary. Remove the forceps after the birth of the head, and attend to the remainder of the delivery. the same as in a natural labor.

Having now given the general rules for the employment of the forceps, it will be proper to refer to its special applications, in each position of the head or face; commencing with those instances in which the vertex has reached the inferior strait.

LEFT OCCIPITO-ANTERIOR POSITION.

This position (as well as all others), should be positively, and correctly ascertained by a vaginal examination; and if the practitioner is not satisfied with the signs detected by the finger alone, he should not hesitate to introduce three or four fingers, or even the whole hand extending the fingers over the head, and ascertaining its true position by feeling its various points.

Having the patient properly situated, he will take the male or left hand blade of the forceps in his left hand, and using two or three fingers of his right hand as a guide, he will carefully introduce it along the left side of the child's head and in front of the maternal left sacro-iliac symphysis, carrying it upward until the extremity of the blade reaches the chin of the child. When the blade is about to be introduced at the vulva, in the direction of the axis of the inferior strait, the handle will lie in an oblique manner over the right groin of the patient, and as the blade passes within the vagina, being guided in the direction of the pelvic axis, the handle will be gradually depressed between the woman's thighs, approaching nearer and nearer toward the median line. When properly applied, the handle will be directed toward the left thigh of the mother, the pivot will look upward and to the left, and the concave edge of the blade will be directed toward the left acetabulum. Having an assistant to hold this blade, the operator will take the female or right hand blade in his right hand, and with the fingers of his left hand as a guide, he will introduce it, above the male branch and nearly opposite to it, in front of the right foramen ovale, gradually conducting it along the side of the head in the occipito-mental direction. When this blade is about to be introduced, the handle will lie obliquely in front of the left groin, and as the blade passes within the vagina, the handle will be gradually depressed between the thighs of the patient, approaching by degrees toward the median line. As soon as this blade has entered to a sufficient distance, and been properly adjusted on the right side of the head—both blades being as nearly as possible in the direction of the occipito-mental diameter, of the child's head—they will lock without any difficulty. When locked, both [illegible] the left thigh of the patient, that of the male blade being uppermost, and the pivot will be directed upward and to the left.

The head being at the inferior strait, as soon as a pain comes on, commence the traction in the direction of the axis of this strait; as the head advances it rotates, the concave edges of the forceps-blades are brought under the pubic arch, and as the movement of extension takes place, the handles must be gradually carried upward in front of the pubic symphysis and abdomen. Accomplishing the remainder of the delivery in the usual way.

RIGHT OCCIPITO-ANTERIOR POSITION.

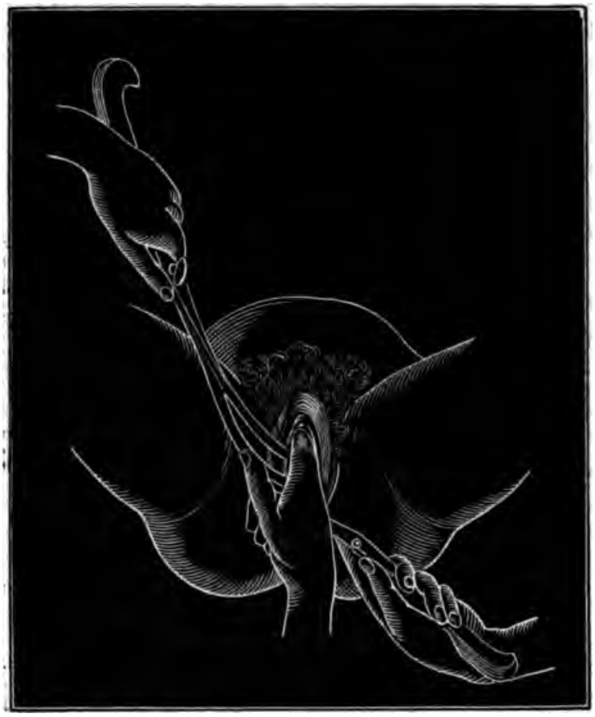
In this position the male blade, which, in all cases, is to be held in the left hand, must be introduced, along the fingers of the right hand, within the left side of the vagina, and by means of a spiral movement, it should be gradually drawn forward so as to apply its concave surface to the left side of the child's head. The handle will at first be inclined obliquely over the mother's right groin, but as the blade advances it will gradually be depressed, and when properly adjusted, the concave edge of the blade will look toward the pubic arch, and the pivot will be directed upward and toward the right thigh. Depressing the handle, so as to admit the introduction of the opposite blade, place it in charge of an assistant, and proceed to apply the other blade. Taking it in the right hand, and with the fingers of the left hand as a guide, introduce it, above the male branch, along the right side of the head. The handle of this blade will lie, at first, obliquely in front of the left groin, but is depressed as the blade is entered upward. When the blades are properly adjusted, in the occipito-mental direction, there will be no difficulty in locking, and the traction will be made as in the preceding instance.

OCCIPITO-PUBIC POSITION.

This position, may include occipito-anterior positions, in which the movement of rotation has been accomplished, and the occiput brought to the pubic arch.

In this position, the male blade will be taken in the left hand, and with the fingers of the right hand as a guide, must be introduced within the left side of the vagina, along the left side of the child's head, and along the left sacro-iliac symphyses. (*Fig.* 68.) When the blade is about to be introduced at the vulva, in the direction of the axis of the inferior strait, the handle will lie in an oblique manner over the right groin of the patient, and as the blade passes within, being directed in a line with the pelvic axis, the handle is gradually depressed, approaching nearer and nearer toward the median line. When properly adjusted, the handle will rest against the perineum, the pivot will be directed upward, and the concave edge of the blade will be under the pubic arch. Placing this in the care of an assistant, the female blade being held in the right hand, and guided by the fingers of the left, must be cautiously introduced, above the male blade (*Fig.* 69) as far within the pelvis, over the right side of the child's head, as may be sufficient. The handle, which, at first, was obliquely over the left groin, is gradually depressed as the blade advances, and if a proper application has been made, the two branches will lock very readily, the concave edge of each, as well as the pivot being directed upward, and the head being grasped by the blades in the occipito-mental direction. (*Figs.* 70, 71.) The traction must be made in the direction of the inferior pelvic axis, that is, forward and downward, and as soon as the occiput is placed under the pubic arch, and extension takes place, the handles of the instrument, will gradually rise upward and toward the abdomen of the female.

FIG. 68.



LEFT OCCIPITO-POSTERIOR POSITION.

In this position the male blade will be introduced within the left lateral part of the vagina along the right side of the child's head, gradually advancing it to a proper adjustment as it enters. At the commencement, the handle will lie obliquely over the right groin, but as it enters it is depressed until the blade assumes the direction of the occipito-mental diameter. At first, this direction can not be exactly obtained, and the soft parts at the outlet will be pressed upon considerably; the pivot of the branch will look upward and to the right, and the concave edges of the blades will look toward the child's forehead. An assistant holding this, the operator will introduce the female blade within the right side of the vagina, and along the left side of the child's head, and when properly applied the two branches will lock readily, with the pivot directed to the right and upward, and the handles will be depressed as far backward as the parts will allow. In both this and the succeeding position, as the blades can not be placed exactly along the occipito-mental diameter at first, they must be gradually brought into this direction as extraction proceeds, being careful not to bruise or injure the soft parts of the mother, or the child's head. In all the occipito-posterior positions, after rotation has been effected, and the *forehead* brought to the pubic arch, the remaining delivery of the head will be accomplished in the same manner, as mentioned in the occipito-sacral position. And, when the head is near the inferior strait, no attempts must be made to rotate the *occiput* under the pubic arch before extracting, lest the child's neck be dislocated; though

FIG 69.

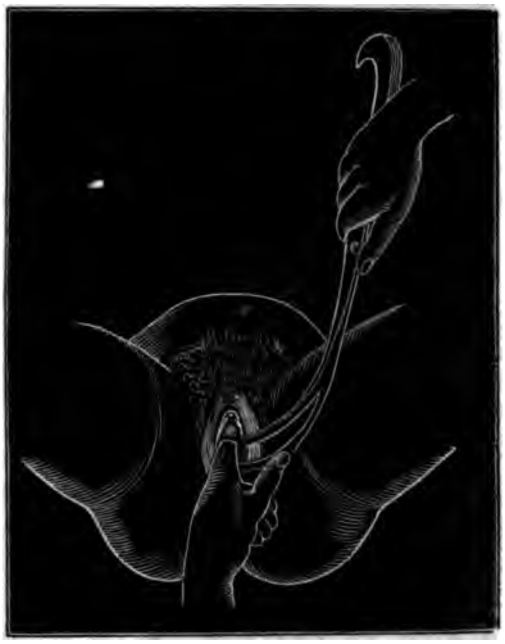
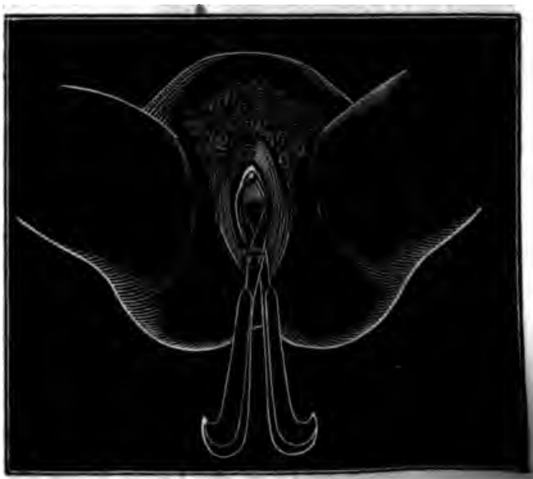
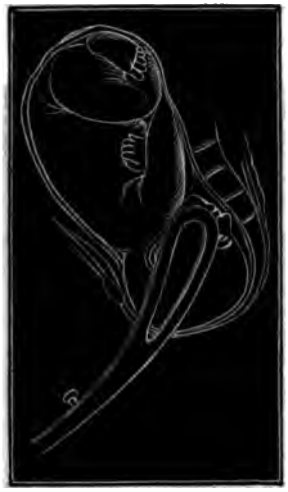


FIG. 70.



careful efforts may be made to bring the vertex into the hollow of the sacrum.

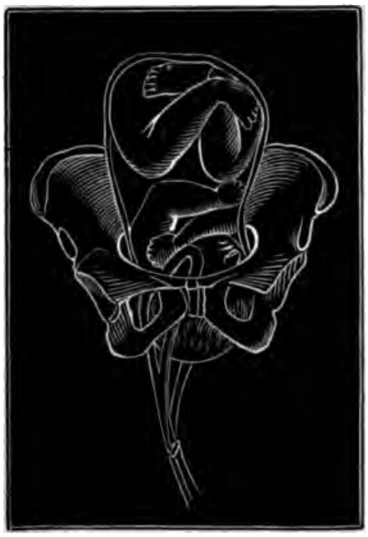
FIG. 71.



RIGHT OCCIPITO-POSTERIOR POSITION.

In this position the blades will be introduced somewhat similar to the mode laid down under the right occipito-anterior. When the branches are correctly adjusted and locked, the soft parts will be considerably pressed upon, the pivot will look upward and to the left, the handles will be very much depressed, and the blades, as in the preceding position, will not at first be exactly in the occipito-mental direction. (*Fig.* 72.) Traction and rotation having brought the forehead under the pubic arch, the remainder of the operation will be the same as in the occipito-sacral position.

FIG. 72.



OCCIPITO-SACRAL POSITION.

In this position the blades are to be applied somewhat similar to the manner named under the occipito-pubic, but with the concave edges of the blades looking toward the child's *forehead* instead of its occiput. When properly adjusted, the concave edges of the blades will be directed toward the pubic arch, the pivot will look upward, and the handles will be depressed so far backward upon the perineum, as frequently to produce a degree of pain. The traction, in this instance, as well as in the two preceding positions after rotation has been effected, is not to be made in the direction of the pelvic inferior axis. The occiput will have to be the first delivered, and to accomplish this it must traverse over the sacrum and perineum. The handles will, therefore, at first, be carried upward so as to produce increased flexion, and bring the occipito-mental diameter parallel with the axis of the inferior strait. This will advance the occiput over the posterior commissure of the vulva, when the handles must be depressed in order to permit the extension of the head to take place, which terminates the operation.

As in these occipito-posterior positions the perineum is greatly dilated, the operator must proceed very patiently and carefully, being especially observant that the proper support be given to it, as the head is passing over, lest it be lacerated. After the occiput has been delivered, should there be a delay in the extension, as the instrument is depressed, a sufficient degree of traction downward and backward may be made, to enable the forehead, face, and chin, to pass from under the pubic arch. The rest of the labor is terminated as in ordinary cases.

LEFT OCCIPITO-TRANSVERSE POSITION.

Occasionally the head will be found lying transversely within the pelvic cavity; the occiput may be directed toward one ischium, and the forehead toward the other. In the present position, the occiput will lie against the left ischium, and the forehead against the right, in a line with the transverse diameter of the pelvis. In each transverse position the rotation must bring the occiput, and consequently the concave edges of the forceps-blades, to the arch of the pubes, and by recollecting this, it may at once be determined how to apply the blades.

In the left occipito-transverse position, the male blade will be applied to the lower and left side of the child's head, after which the female blade will be applied to its upper and right side. In order to effect the application with as little difficulty as possible, pass the male blade within the left lateral and posterior part of the vagina along the left sacro-iliac symphysis, and when it has entered sufficiently, carefully move the blade to the hollow of the sacrum, and its concave surface will be over the left side of the child's head. Having an assistant to hold this, introduce the female blade along the right anterior part of the pelvis, behind the right acetabulum, and by gentle efforts work it gradually to the symphysis pubis, that its concave surface may be applied over the right side of the child's head. When the blades are properly adjusted, they will lock without any difficulty, and the pivot will be directed toward the left thigh of the mother.

Traction must now be made in the direction of the pelvic axis corresponding to that part of it, however, in which the head is situated, and at the same time rotation from left to right should be slowly and gently attempted. When this has been effected, the remainder of the delivery will be terminated in the usual manner.

Prof. Meigs observes, that in this position, when the male branch is introduced as above, the handle is strongly abducted toward the left thigh and interferes with the depression, and consequently the application of the female branch, and to avoid this difficulty, he advises the female blade to be the first introduced. His method of application is thus:—"Take the female or upper blade in the right hand, and introduce it into the posterior and right side of the vagina, conducting its point as near as may be to the chin, and over the face to the right side of the head behind the pubis, leaving the handle to project toward the left thigh. Next, take the male blade into the right hand, and, turning the concave edge of the new curve downward, insert the point into the right side of the vagina, below the female branch. Let the fetal face of the clamp apply itself to the convexity of the head, and slide it onward, and, in proportion as it enters, make it sweep round the crown of the head toward the back of the pelvis. In effecting this, the handle comes gradually down as the clamp gets on the left side of the cranium, and at last the lock is found to be where it ought to be, namely, under the upper or female blade, with which it is then locked." This, undoubtedly, appears to be the better method of introducing the blades, but, as with all other cases, the practitioner who is well versed in the general principles of these operations will be governed by the peculiar circumstances attending each individual case.

RIGHT OCCIPITO-TRANSVERSE POSITION.

In this position the head lies in the direction of the pelvic transverse diameter, the occiput resting against the right ischium, and the forehead against the left. The application of the forceps is similar to the preceding, with the exception that the female blade must be applied to the right side of the child's head, along the posterior part of the pelvis, while the male blade must be over the left side of the head and behind the pubic symphysis. The male branch is generally the first introduced, though some authors advise the female. As before stated, it will commonly be found more advantageous to enter that blade first, which is of the most difficult application, being particular, however, that the introduction be so managed as to cause no difficulty in the locking.

The same manipulation will be required, as in the preceding position, excepting that the rotation must be made from right to left, in order to carry the occiput under the pubic arch; this accomplished, the labor must be terminated as usual.

CHAPTER XLIV.

MODE OF APPLYING THE FORCEPS AT THE BRIM,—IN FACE PRESENTATIONS, AND IN PELVIC PRESENTATIONS.

When the HEAD IS AT THE SUPERIOR STRAIT, the pelvis being of normal size, and circumstances occur requiring the delivery to be expedited, turning should always be preferred to the use of the forceps. But when the head has engaged in this strait and descended so low as to render the operation of turning impossible, the os uteri being dilatable, and immediate delivery necessary, the long forceps may be frequently employed with advantage, even though the head has not advanced so far within the cavity, as to enable an ear to be felt. They may likewise be applied with benefit in cases where the antero-posterior diameter of the superior strait is only three or three and a half inches, and the natural efforts are insufficient to advance the head. To these conditions, therefore, should the application of the forceps at the brim be limited.

It must not be supposed that an operation at the brim, with this instrument, is an easy one; on the contrary it is both difficult and hazardous. The position of the head above the brim can not be easily ascertained, and if it could be, it would make but little difference, as the forceps can be applied only along the sides of the pelvis; consequently, the head may be grasped by the blades in its bi-parietal diameter, or in its occipito-frontal, the latter more frequently. The mobility of the head, when not held by the brim, also renders the adjustment of the blades a troublesome matter, and frequently, their hold on the head being imperfect, as soon as tractions are made, they may suddenly slip and seriously injure the cervix. Hence, when it becomes necessary to use the instrument at this point, the operator should proceed carefully and judiciously.

The difference between the application of the forceps at the brim, and at the outlet, is, that in the former, the whole hand must be carried within the vagina, and two or three fingers be passed as high up as possible between the cervix and head of the child, and the instrument is to be introduced along the sides of the pelvis, so that a blade will be applied within each ilium. When properly adjusted they will lock more or less readily, and the handles will be depressed backward as far as possible, that the blades may take the direction of the superior pelvic axis. Sufficient compression should be exerted on the handles to hold the head securely, and the traction should be made, as in the other-instances, not by sudden, short jerks, nor by any forcible measures, but by a full, slow, regular motion from handle to handle, making traction in the direction of the axis of the brim.

If the instrument does not lock readily, no force or twisting must be used to effect it, but the operator should withdraw the blade last introduced and reapply it; and this had better be repeated several times, than to endanger laceration of the cervix or soft parts by forcible and unnecessary endeavors to lock the branches.

Should the head lie with one parietal protuberance resting on the pubis, and the other on the sacral promontory, the forceps will be applied with one blade over the occiput, and the other over the forehead, or, perhaps, over the face. Should the traction and lateral motions communicated to the instrument cause the head to take a diagonal position and descend into the pelvic cavity, the blades may be withdrawn, provided the natural efforts are sufficient to conclude the labor; if not, the blades must be readjusted, but this time on the sides of the head.

If, after having used a justifiable force in the operation, we find it impossible to advance the head, or at least without exerting a power which would unnecessarily expose the mother to dangers, it then becomes our sad duty to resort to the perforator; and if a delay would not add to the mother's risk, the operator can act as soon as the stethoscope determines the child's death. We are never to save the life of the child at the expense of the mother's; and, in most cases, the death of the child can be determined by the stethoscope in sufficient time for the mother's safety.

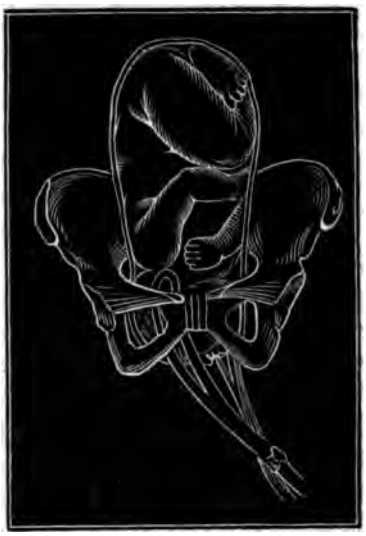
When the occiput is fastened behind the pubis, and the forehead is in front of the sacral promontory, the blades will then pass over the sides of the head; and when this is ascertained to be the case, the operator may exert more force than before, and probably the difficulty will be more readily overcome. When the head is locked at the brim, Dewees advises us—after having applied the forceps—to first elevate the head, by gently carrying the handles from side to side, at the same time pushing the instrument upward. This may be beneficial in some cases, but usually, where the operation will prove successful, as the handles are rotated from side to side with sufficient traction, the head disengages, rotates, if necessary, to the oblique diameter, and descends into the pelvic cavity.

The forceps may sometimes be required in FACE PRESENTATIONS, in which case the blades are to be applied over the ears of the child, similar to the manner named in vertex presentations; being careful to so adjust them as to bring the chin toward the pubic arch. And in all operations when the face presents, the operator should proceed slowly, so as to permit the body to undergo a rotation, and thus prevent a twisting or dislocation of the neck.

LEFT MENTO-ILIAC POSITION.—(*Fig.* 73.)

As the chin is the part to be brought to the pubic arch, in this position the male blade will be passed in front of the sacrum, and over the right side of the child's head, as much as possible in the occipito-mental direction. An assistant holding this, the female branch will be gradually insinuated anteriorly, over the left side of the child's head, and when the two are properly adjusted they will readily lock. The concave edges of the blades will then be directed to the left of the pelvis, and the pivot will look toward the maternal left thigh: both of these may also be directed upward, if, instead of a complete transverse position, the chin is placed somewhat anteriorly, in a line with the oblique diameter of the pelvis. The handles must then be rotated from below upward, and from left to right, gradually bringing the chin, as well as the concave edges of the blades, under the pubic arch: this having been effected, traction must be made directly forward and slightly downward, to free the chin from under the arch, after which the handles must be slowly elevated to gradually flex the chin, and which motion causes the head to pass successively over the hollow of the sacrum, perineum, and posterior commissure of the vulva, while at the same time the several parts of the face are disengaged in succession.

FIG. 73.



RIGHT MENTO-ILIAC POSITION.

In this position the operation will be very nearly similar to the preceding one: the female blade will be the first applied along the posterior part of the pelvis to the left side of the child's head, while the male blade will be carefully guided over the right side. When correctly adjusted, they will lock, the pivot being directed toward the mother's right thigh. Rotation will be made from below upward and from right to left, until the chin is brought to the pubic symphysis, when the rest of the operation will be the same as in the one previous.

In each of these mento-iliac positions, should the face not have arrived at the inferior strait, it will be proper to conduct it there by tractions and lateral motions, the same as in vertex presentations; after which operate as recommended. Some authors reverse the order of introducing the blades, preferring to use the male blade first, in the right mento-iliac position, and the female, first, in the left mento-iliac. The operator will employ his own judgment in this matter, always bearing in mind the rule to enter the blade of more difficult application first.

MENTO-PUBIC POSITION.

The chin being placed at the symphysis pubis, and the forehead at the sacrum. In this position, or when the face has assumed it, the head having descended into the pelvic cavity and performed its movement of rotation, the forceps may be more easily applied than in the two preceding positions. The male blade must be applied along the left side of the pelvis, grasping the right side of the child's head, and the female blade must be passed along the right side of the pelvis to grasp the left side of the child's head. Traction forward and slightly downward must then be made, to disengage the chin from under the pubic arch, after which, elevate the handles, thereby effecting at the same time flexion and the liberation of the head.

MENTO-SACRAL POSITION.

The chin being placed at the sacrum, and the forehead at the symphysis pubis. This is a position with which I have never met; and were it not that cases have been recorded by individuals of eminence and undoubted authority, I should be very much inclined to doubt the possibility of its occurrence, except, perhaps, in case of a very small child passing through an exceedingly large pelvis.

However, should such a position be met with, requiring the use of the forceps, it is recommended to introduce the male blade along the left side of the pelvis and on the left side of the child's head, and the female blade along the right side of the pelvis on the right side of the head. When properly adjusted, the handles will be strongly depressed against the perineum. The face having reached the outlet, the handles must at first be elevated so as to pass the chin over the perineum and posterior commissure; this having been accomplished, depress the handles, which, with a degree of traction, will flex the chin, and disengage the head from its position at the pubes.

The FACE MAY BE ABOVE THE SUPERIOR STRAIT, and *movable*. If the methods heretofore advised for changing it to a vertex presentation do not succeed, and pelvic version can not be accomplished, it has been recommended to attempt the delivery by the forceps. This, however, will more frequently be found impracticable, the perforator being required in the majority of instances. When the head is thus situated above the brim, the face usually presents in a transverse direction, and the forceps would have to be applied with one blade over the forehead and top of the head, and the other over the chin, pressing upon the child's neck; so that, beside the danger of the blades slipping from these parts, any efficient degree of compression or traction would almost certainly occasion the death of the child.

The same may be said of those cases where the HEAD HAS PARTLY ENTERED THE SUPERIOR STRAIT; but there is a greater possibility of success, if the blades can be applied upon the sides of the head; in which case the mode of application will be the same as in the preceding face positions. In each of the above conditions it will be necessary to introduce the whole hand within the vagina, as a guide to the forceps-blades.

In the last condition, the head being partly within the cavity and partly within the brim, but with the CHIN DIRECTED TO THE SACRUM, and it being impossible to change the position to a vertex presentation, or to accomplish pelvic version, it has been recommended to slowly and carefully rotate the chin to the pubis, as the head is made to descend by the forceps. I consider this not only a difficult task, but almost an impossibility, at least as far as safety to the child is concerned; and, as a general rule, when it becomes necessary to expedite delivery in these cases, I believe it will be found that the perforator will ultimately be required before the labor can be terminated.

In PELVIC PRESENTATIONS, or in cases where pelvic version has been performed, it not unfrequently occurs, that after the expulsion of the body, there is a delay or difficulty attending the delivery of the head, in which cases, should the accoucheur not be able to remove the obstruction by flexing the head with his hand, as heretofore described, he will have to employ the forceps. Hence, as a very short delay may prove fatal to the child, the most prudent course to adopt, in all these labors, is to have the instrument at hand at as early a period as possible, after their character has been ascertained.

In these labors, the head may be found in one of two positions, viz: with the occiput to the pubic arch, and the face in the hollow of the sacrum, and which is always the most desirable position; or, with the face to the pubis and the occiput in the hollow of the sacrum—a most undesirable position. If the forceps be required to deliver the head, the rules for operating are similar to those given in vertex presentations.

OCCIPITO-PUBIC POSITION.

In which the occiput is to the pubis, and the face to the sacrum. Carefully envelop the arms and body of the child in a napkin, and carry it upward, or toward the mother's abdomen, but not so far as to endanger its neck; then, let an assistant hold the child in this position, that its body may not be in the way of the operator. The latter having introduced two or three fingers of his right hand along the inferior and left side of the vagina, as a guide to the forceps-blade, will, with his left hand, carefully apply the blade of the male branch upon the right side of the child's head. Then intrust this to the care of an assistant, who will depress it somewhat to permit the application of the female blade. This will be introduced, being held by the right hand, and guided by the fingers of the left hand, along the inferior and right side of the vagina, and thence upon the left side of the head. When properly applied, the forceps-blades will grasp the head in its occipito-mental diameter, and will lock readily. Holding the instrument in the manner heretofore recommended, the operator will commence his tractions and oscillatory movements, and as the head emerges the handles must be gradually elevated, the same as in occipito-anterior positions, by which the chin, face, forehead, and vertex, successively, pass over the perineum and posterior commissure, and the delivery will be thus terminated.

Should the occiput be directed to the left, or right lateral anterior portion of the pelvis, the operator will be governed by the above rules, as well as those named for occipito-anterior positions, being careful to so introduce the blades, that, at the termination of the delivery, their concave edges, together with the child's occiput, will be brought under the pubic arch.

OCCIPITO-SACRAL POSITION.

In which the face is to the pubis, and the occiput to the sacrum. This is a very unfortunate position, and one which may prove very painful to the female, and troublesome to the practitioner. Although it is more frequently the result of ignorance, or want of skill, on the part of the accoucheur, yet it will sometimes occur in the hands of the most skillful. In this position, the body of the child being enveloped in a cloth, as before, must be carried backward, so that its back will rest against the perineum of the mother. The blades are introduced as in the previous position, in front of the child's thorax, the male blade along the left side of the pelvis, and on the left side of the child's head, and the female blade along the right side of the pelvis, and on the right side of the child's head. The instrument being properly applied, and the head brought to the outlet, instead of elevating the handles to pass the occiput over the perineum, they must be strongly depressed downward, with sufficient traction, so as to cause the chin, face, forehead, and vertex to pass successively from under the pubic arch, while at the same time the occiput is made to revolve on its axis, in front of, and upon the perineum.

If the occiput be directed to the left, or right lateral posterior portion of the pelvis, the above rules, together with those given in occipito-posterior positions, will be sufficient to guide the educated practitioner.

In addition to the preceding instances, the forceps have been found occasionally advantageous in irregular presentations of the head, as of the ear, forehead, etc., in which manual endeavors to correct the position have failed; and also in some cases of diminished size of the diameters of the inferior strait. Whatever circumstances may present during labor, requiring a resort to the forceps, the practitioner will apply them according to the peculiar nature of the case, being, however, always governed by the rules already explained.

CHAPTER XLV.

CRANIOTOMY — PERFORATOR — CROTCHET — CESAREAN OPERATION — SYMPHYSEOTOMY.

CRANIOTOMY is an operation by which the life of the child is destroyed, for the purpose of preserving that of the mother; it is also employed in some cases when the child is dead. The terms embryulcia, embryotomy, and cephalotomy, have been applied to this operation; while the terms evisceration, exvisceration, and exenterismus, have reference to the removal of the contents of the trunk.

As has been heretofore named and repeated, the safety of the mother is the first and essential consideration in the practice of obstetrics, and if, in order to insure this, it becomes necessary to sacrifice the child, however painful or revolting to the feelings of the operator this unpleasant task may be, he must not shrink from his duty, nor hesitate to adopt every measure in consonance with the preservation of his patient. Beside, it must be recollected that the death of the child is certain, in cases where craniotomy is admissible; it cannot be saved by any means, unless we except the Cesarean operation, which proves fatal, on an average, to the children once in every 3½ cases— to the mother once in every 2¼. The operation is not to be undertaken heedlessly, nor without due consideration, and a proper consultation with one or more experienced accoucheurs; and is only to be attempted when both mother and child would be destroyed, were the labor left to the natural efforts, and when version, or delivery by the forceps can not be accomplished, and the pelvic diameters are sufficiently spacious to permit the extraction of the mutilated infant.

According to Churchill, craniotomy has been performed in British practice 270 times in 54,485 cases of labor, or about 1 in 201¾; in French practice, 30 times in 36,169 labors, or 1 in 1,205⅞; in German practice 132 times in 256,655 labors, or 1 in 1,944¼. Making a total of 347,309 labors, in which the operation was performed in 432, or about 1 in 803¾. The results to the mother have been 60 deaths in 303 craniotomy cases, or about 1 in 5. The operation, therefore, as compared with the employment of the forceps, is less favorable; and much of this mortality may be owing to the fact, that the feeling and humane obstetrician being unwilling to take the life of the child, even in so justifiable a cause, has hesitated to perforate until assured of its death; and the delay thus occasioned has rendered the operation much more unfavorable to the mother, than if it had been earlier undertaken.

Perforation of the fetal skull is generally advised in cases of diminished pelvic diameters, but the degree of this diminution is not positively settled. Thus, Dr. Osborn considers the operation necessary when the antero-posterior diameter is not less than 2¾ inches. The smallest diameter through which a living child can pass, is stated by Dr. Clarke, to be 3½ inches; by Dr. Burns 3¼; by Dr. Le Roy 3¼; by Dr. Atkin 3; by Dr. Ritgen 2; these differences of opinion have, probably, resulted from the various sizes of the fetal heads met with by each practitioner, as well as their degree of skillfulness in the application and use of the forceps.

As a general rule, where the superior antero-posterior diameter of the pelvis is contracted to about three and a half inches, and when the forceps fail to extract the fetal head, this being of usual size, the perforator will be required; though it must be remembered, that with such a pelvic measurement, there is a possibility of extraction with the forceps. But when the extent of this small diameter is reduced, to three inches, the forceps can be of no avail, and craniotomy will necessarily be required. When the pelvic contraction is extraordinarily great, it will be impossible to extract even a mutilated child, in which case, the Cesarean operation is recommended. Dewees considers the operation of craniotomy inadmissible where the diameter measures only two inches; Baudelocque, limits it to one and two-thirds of an inch; and Davis, to one inch. The limit named by Baudelocque is probably the most correct.

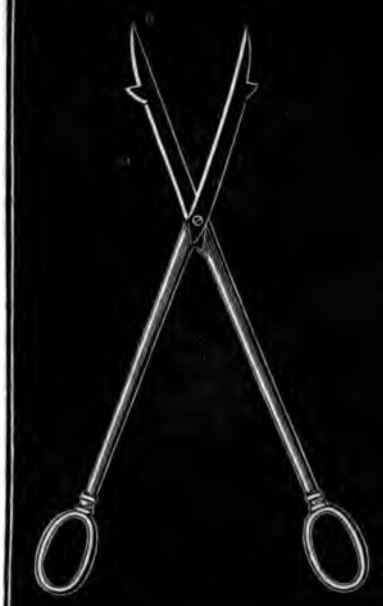
Craniotomy may be performed—in all cases of deformed pelvis—whether of the cavity or of the straits, in which delivery can not be effected naturally, or by the forceps; in cases of pelvic tumors or other abnormal growths, which present an obstacle to the expulsion of the child by other means—either natural or artificial; in cases of tedious and painful labor, when the child is dead, and can not be removed by the forceps; in cases of hydrocephalus, when the head can not pass through the pelvis; in cases of ruptured uterus, hemorrhage, convulsions, etc., where the life of the woman is endangered, requiring immediate delivery, and where it is impossible to use the forceps; in cases where an extremity descends along with the head, causing an impaction which can not be overcome by the forceps; in pelvic labors, when the head can not be extracted by the forceps, after the expulsion of the body; in cases where the head, remaining within the pelvis, has been separated from the body; and, in all cases, where from exhaustion, irregular vertex presentations, or other conditions, the patient is placed in imminent danger, and in which the forceps can not be applied, or, in which the circumstances of the case contra-indicate their employment.

The practitioner who undertakes the operation of craniotomy, must not be too hasty in his conclusions, nor in his attempts at operating—he must be positive that it is imperatively necessary, especially if the child be living—to destroy a living child, without undoubted evidence that no other method will save the mother's life, is a criminal act—it is murder. When the uterine contractions have been powerful and long-continued, without any advance of the head, he will be justified in terminating the labor, by the forceps, if possible, or if not, by the perforator and crotchet. The same may be said, in cases where, from exhaustion, uterine inertia, or other causes, endangering the mother, and when there is little or no hope for the preservation of the child, the forceps are contra-indicated. Nor should the operator hesitate to act at once, in those cases where he clearly ascertains at an early period that the child can not be delivered except by craniotomy—as, for instance in an enormous hydrocephalic head, in a small pelvis, in a large head firmly ossified, etc. To delay the operation in these cases until dangerous symptoms manifest themselves, would be to unjustly compromise the mother's life—while, prompt action, when her system has not yet become depressed, and is capable of more securely withstanding the shock of the operation, will be the wiser and more prudent course.

In cases requiring immediate interference, at an early period of labor, the operation must not be attempted until the os uteri is sufficiently dilated and fully dilatable. In all other cases we must be governed by the circumstances connected with them, making endeavors to deliver by the forceps if there is the slightest chance of these being made available.

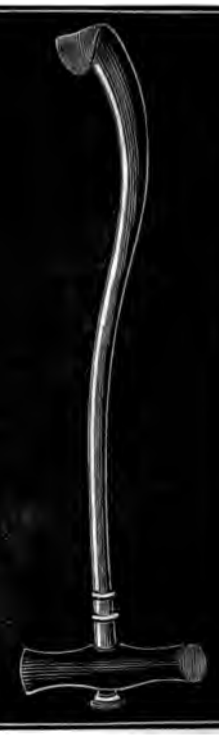
The instruments used in the operation of craniotomy, are the perforator, or Smellie's perforating scissors, and the crotchet. Prof. Meigs recommends the use of a perforating trocar or drill, made especially for this purpose, and, instead of the crotchet, he has invented two embryotomy forceps, one of which is strait, and the other curved; each of these are serrated on their inner jaws, to enable them to take a very sure and strong hold upon the cranial bones, and are rounded on their sides, in order to prevent them from taking hold of any of the maternal tissues. These he considers superior to, and much safer than, the

Fig. 74.



Perforator.

Fig. 75.



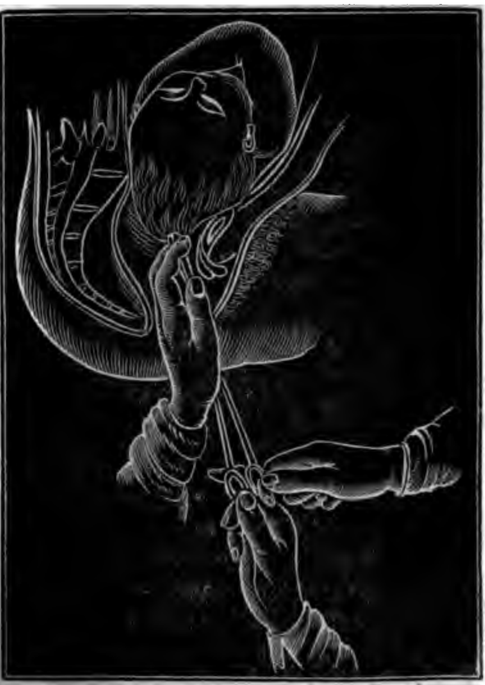
Crotchet.

perforating scissors and crotchet. Other instruments have been presented to the profession, as the cephalotribe, etc., but, they are rarely employed.

The *dangers* to which craniotomy exposes a female, are, injury to the vagina or uterus, from slipping of the perforator or crotchet; laceration of the perineum, from the employment of improper extracting force; subsequent tendency to inflammation of the vagina, or uterus; perforation of the bladder, especially when the operation has been carelessly or too forcibly performed; and the shock to the nervous system is usually much greater than in turning, or in the use of the forceps. Instances have occurred where, from a neglect to completely break down the brain and medulla oblongata, the child has been born breathing and even crying.

MODE OF OPERATING.—Previous to operating, the bladder and rectum of the patient must be thoroughly evacuated. Then she must be placed in the position named for a forceps-operation, with the hips over the edge of the bed, and some cloths under her to receive the pieces of brain, etc., which are discharged. An assistant should place his hands upon the abdomen, and maintain them there, during the whole of the operation, to fix and steady the uterus. Anæsthesia may be produced, if the patient be in a condition not contra-indicating it; though, I should adopt it with considerable hesitation, from the fact, that extensive injury might be done to the maternal tissues while she lies in an unconscious state, and no timely warnings could be made to announce to the operator when the danger from this circumstance commenced.

FIG. 76.

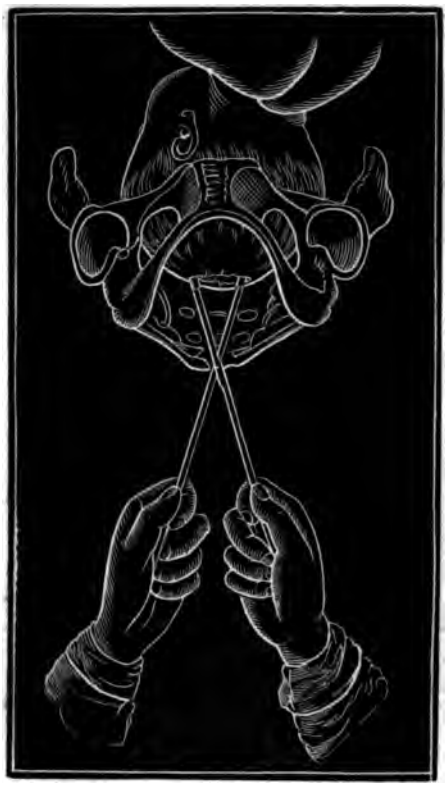


Introduce two fingers of the left hand within the vagina, and carry them upward until they come in contact with the part to be perforated.

This should be the most depending portion of the head, and a suture or fontanelle should be avoided, because after the perforation is effected in one of these, the opening becomes closed from a collapse of the cranial bones. Then carry the perforator, which must be warmed and greased, carefully along the inside of the fingers, being particular not to injure any of the parts of the mother, until the sharp point comes in contact with the part selected for the incision.

Still guarding the instrument from slipping or injuring the mother, press it firmly but moderately, against the fetal skull, at the same time giving to it a rapid boring or semi-rotatory motion; a few motions will suffice to pierce the bone, which may be known by the cessation of any further resistance. (*Fig.* 76.) Then push up the scissors until the shoulders or rests at the base of each blade, prevent their further advance. Holding one branch of the instrument firmly, with the thumb passed into its eye or ring, the fingers of the other hand still protecting the mother from injury, by being placed upon the elbows or rests as they move, to ascertain that they do not leave the skull—an assistant will take hold of the other branch, and separate it from its fellow to an extent of three inches, and which will cause the blades to make an incision about an inch long. (*Fig.* 77.)

Fig. 77.

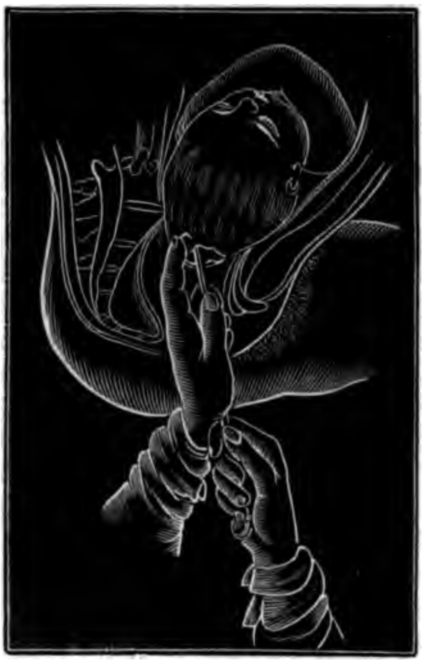


Then, without withdrawing the instrument from the vagina, turn it round, and place its point upon the outer surface of the skull, so as to form another incision at right angles with the first, and crossing it, and which is to be done in a similar and guarded manner, as before. This having been accomplished, pass the blade through the crucial incision, within the skull, and thoroughly break down the brain, by alternately opening and shutting the blades, and turning them rapidly round in various directions; and be sure to cut across the medulla oblongata, so as to completely destroy the life of the child. The scissors will now be withdrawn, together with the fingers covering their cutting edges.

If there exists no necessity for immediate delivery after the destruction of the brain, the operator may wait a reasonable time to ascertain whether the natural powers will be sufficient to terminate it. But if the operation has been commenced after symptoms of exhaustion, or other serious symptoms have manifested themselves, he will proceed without delay, to finish the labor.

Re-introducing the fingers of the left hand, the crotchet, having been previously warmed, must be passed along them into the cranium, and if the breaking down of the cerebral mass was not completely effected by the scissors, it may now be by the crotchet. After which, insert the point of the crotchet on the internal surface of the bone, keeping a finger of the left hand upon the head externally, and opposite to the inserted point of the instrument, in order to cover it, and prevent injury to the maternal parts, should it slip, or break through the bone. (*Fig.* 78.) Protecting the surrounding parts from injury, by folding the scalp over the edges of the bones, the practitioner will, by a gradual, steady force, applied in the direction of the superior pelvic antero-posterior diameter, commence the extraction of the bones. He must not pull by jerks or he will fracture the bones, and the traction must be made during the pains, or if these are absent, they should be imitated by allowing intervals from time to time during the extraction. Whenever the bone breaks under the crotchet point, this must be applied to some other resisting part of the skull.

FIG. 78.

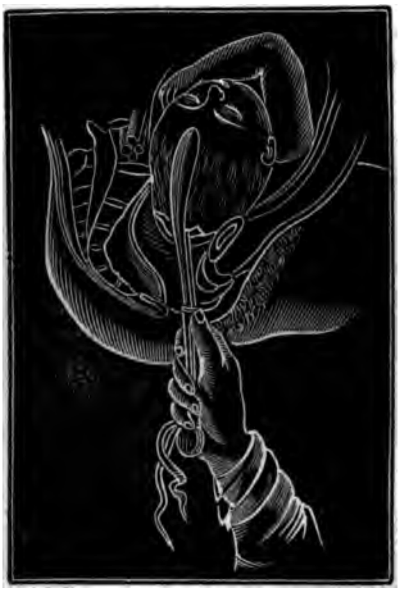


Frequently, the bones will break and come away by pieces, and th
great care should be observed in removing them, whether by the fin
or the bone forceps made for this purpose. If the head does no

readily, or if a secure purchase can not be made with the crotchet, Meigs's embryotomy forceps may be used; or, if delay be not contra-indicated, the structures will become weakened after some hours, which will render them of more easy extraction. But I consider prompt delivery, after perforation of the skull, the better and safer method in all cases.

Some writers recommend the craniotomy forceps, which are to be used by passing one blade upon the inner surface, and the other upon the outer surface of the skull so as to take a firm and secure hold and then make traction at intervals the same as with the crotchet. (*Fig.* 79.) After the birth of the head, it should be covered with a cloth, and if there be a delay in the advance of the shoulders, traction may be made upon the neck in the direction of the axis of the brim, or a blunt hook may be passed under one, or each axilla, to facilitate their expulsion. Sometimes, the trunk will not advance, when it will become necessary to perforate the chest and remove its contents, as well as those of the abdominal cavity, extracting the ribs by the crotchet, somewhat similar to the removal of the cranial bones.

FIG. 79.



In case of a separation of the head from the body, the latter being delivered, the forceps will require to be applied in order that the head may be held firmly, while the perforator is being used to reduce its size.

After the operation, keep the patient quiet, overcoming the nervous shock by the compound powder of Ipecacuanha and Opium, or some similar preparation, and the vagina may be occasionally cleansed by injections of warm water. Should symptoms of inflammation set in, promptly remove them by the proper measures.

CESAREAN OPERATION. The Cesarean section, or hysterotomy, is a less favorable operation to the mother than either of the preceding, and, consequently, is never to be attempted for the purpose of delivering the child, except as a last resource. Though a simple operation, it is exceedingly dangerous, and should never be undertaken except upon justifiable grounds. According to statistics — which are hardly reliable, from the fact that the cases reported are generally the successful ones, a number of the unsuccessful being suppressed — about one mother in two and one-third is saved, and about one child in three and one-third.

The operation is resorted to with a view of effecting delivery with safety to the mother and her offspring, in those cases, where it is impossible to deliver through the natural passages, either by the forceps or perforator. In a pelvis whose superior antero-posterior diameter does not exceed one and a half inches, it will be almost, if not quite impossible, to extract even a mutilated child, without powerful efforts, exposing the mother thereby, to at least as serious results, as would be likely to follow this section. And in such cases the operation will be required whether the child be alive or not. Mollities ossium, or the presence of tumors or other abnormal growths within the pelvis, reducing its diameters, and preventing the advance of the child, may render a resort to this operation necessary, especially when they can not be removed or lessened in size, by other means, heretofore referred to.

When the mother has died suddenly during labor, the child being still alive, the Cesarean operation has frequently been the means of saving it; and in order to afford it every opportunity of being saved, the operation should be performed as promptly as possible.

The *dangers* to which the Cesarean section exposes the female, are, hemorrhage, both from the uterine and abnormal bloodvessels, though fatality from this cause occurs less frequently than was formerly supposed; subsequent inflammation of the uterus, or peritonitis; death from the shock to the nervous system; and, strangulation of a portion of the intestines, which may be held between the lips of the external incision, or, that made in the uterus.

The earlier the operation is performed, the more favorable will it be for the mother, because her strength will be less impaired than after a prolonged uterine action; and in cases, where it is positively known that the operation must be performed before delivery can be effected, it should be undertaken at the commencement of labor. The period named by authors as the most favorable for operating, is either before, or immediately after the rupture of the membranes, and the longer the operation is delayed after this has taken place, the more unfavorable will it be for the mother.

Several cautions are given, by those who have performed the operation, which it is necessary to be mindful of; according to Ramsbotham, these are: 1st, to avoid dividing the tendinous expansion of the recti muscles forming the linea alba, because from its low degree of organization it would not be so apt to heal as kindly as the muscle itself; 2d, to avoid making the incision so far toward the side as to run the risk of wounding the epigastric artery; 3d, to expose the naked surface of the uterus no longer than is absolutely required, being especially careful to handle the organ as little as possible; 4th, to avoid making the incision at the side of the uterus, or at that part of the organ to which the placenta is attached, on account of its being the most vascular part, and which may be ascertained by the stethoscope; 5th, to avoid wounding the child when incising the uterus; 6th, not to allow much time to elapse between the extraction of the child and that of the placenta; 7th, be especially careful that none of the intestines become included with the lips of either incision, as the risks of strangulation would be added to those of the operation.

MODE OF OPERATING.—Having previously emptied the bladder and rectum, the female is to be placed upon her back, with her shoulders and head elevated by pillows; she may be in bed, or upon a table with a mattress upon it, and may lie lengthwise, or with her hips brought to the edge of the bed, the feet hanging down toward the floor. Ramsbotham advises the temperature of the room to be brought to at least 80° Fahrenheit. In order to avoid injury to any of the uterine appendages, the uterus must be brought in the median line, and kept there by the hands of an assistant being placed over it; and to prevent any part of the intestines from insinuating themselves between the uterine and abdominal walls, a second assistant may make pressure with one hand over the uterine fundus. An incision of about six inches in length is now to be made through the abdominal walls, extending from a short distance below the umbilicus, to within about two inches of the pubes, as a further extension of it would endanger the bladder. The incision may be made a little to the left or right side of the linea alba, as the operator may determine. The parts should be carefully divided as far as the peritoneum, into which a small aperture is to be cautiously made, sufficiently large to admit the introduction of the index finger of the left hand as a director for a probe-pointed bistoury, and to prevent it from wounding the intestines. The peritoneum must be divided until the incision is of the same dimensions with that of the integuments above, when the uterus will be brought into view. An incision is now to be made into the uterus, carefully dividing layer after layer, until the placenta, or the membranes are brought into view, and which latter, may be known by their transparency. Make a slight opening into the membranes, if these have not been ruptured previously, and by means of pieces of soft sponge remove some of the liquor amnii, or it may be more quickly removed by a proper syringe. Then enlarge the orifice in the membranes, withdraw the child, tie the cord, and extract the placenta and membranes, having first twisted them into a cord. Should the placenta, however, present first, it must not be divided, but detached at one side that the membranes may be reached.

When the membranes are ruptured, the assistants must be careful, in holding the lips of the wound apart, that the abdominal and uterine walls are kept in contact with each other, that none of the amniotic liquid may pass between them into the abdominal cavity. After the removal of the child, the uterus commonly contracts and detaches the placenta; but if this be not effected, it must be accomplished artificially. The operator must also ascertain that the canal of the cervix is free, in order that the lochia may escape, and this may be learned by passing a finger through the os uteri from the wound, and one or two of the other hand, per vaginam.

Any blood, or other foreign body which may have passed within the uterine cavity, must be removed, and the wound in the organ must be well cleansed. The contraction of the uterus generally brings the lips of the wound in opposition, so that no sutures will be required, and there will be but little hemorrhage. Should any blood have escaped into the abdominal cavity, remove it by lightly sponging; and, while an assistant retains the intestines in their place, close the wound in the abdomen by as many sutures as may be necessary, leaving a space at the lower part for the exit of the fluids which escape from the abdomen. Between and over the sutures, strips of adhesive plaster should be applied, over which a common compress, either dry, or moistened with cold water, must be placed, the whole being kept in position by a bandage drawn moderately tight.

Blundell suggests the propriety of rendering the Fallopian tubes impervious, by removing a small portion of their substance on each side, during the operation, thereby preventing the possibility of conception, without destroying the sexual appetite.

During the operation, and immediately after, the condition of the patient may render the administration of cordials necessary. When she has been placed in bed, administer an opiate, and treat the case on general principles to lessen irritability, and prevent or allay any febrile or inflammatory symptoms which may come on, treating them promptly and energetically. The patient must be kept quiet, visitors must be excluded from the room, which should be kept rather cool, and any inflammation along the edges of the incision must be at once reduced by cold water, or fomentations, as seems best suited to the case.

Small doses of tincture of Aconite root, with or without tincture of Gelseminum, will aid considerably in averting inflammation. The diet must be exceedingly light, and the utmost care and attention should be bestowed upon the female. The child should be fed until the mother is beyond danger, and in the meantime the milk, should any be present, may be removed by a young puppy, or by a pump made for this purpose.

It is always proper to have warm water on hand, in order to place the child in it, should animation be suspended.

The operation of SYMPHYSEOTOMY, or an artificial separation of the pubic bones at their symphysis, has been advised in cases of excessive deformity of the pelvis; but as I cannot conceive of a case in which it would be justifiable, being attended with many dangers, I shall not enter into any description of it.

A necessity for the operations above-named, may frequently be obviated, where the pelvic measurements are known to be too small, by the induction of premature delivery, or even, in some cases, of abortion.

CHAPTER XLVI.

INDUCTION OF PREMATURE LABOR.

In cases where it is known that the fetus, at full term, would be unable to pass through the pelvis, either naturally or by the aid of forceps, owing to a deformed condition of the pelvic bones, the INDUCTION OF PREMATURE LABOR is recommended; an operation which has for its object the safety both of the mother and her child. This operation originated in England, where it has been practiced since 1756, at which time, we are told by Denman, a consultation of the most eminent practitioners in London was held to determine the question of its morality, safety, and utility; which having been decided affirmatively, the operation was first successfully performed by Dr. Macaulay. From England it was carried into Germany, in 1799, by A. Mai, but was not practiced until in 1804, by Wenzel. In France, it was not performed until in 1831, by Stoltz, having previously met with much opposition as an immoral and criminal procedure. At this time, however, it is considered by all obstetricians as a perfectly justifiable operation.

The induction of premature labor consists in exciting the uterus to contract, leaving the subsequent expulsion to the natural efforts; consequently, it differs from a "forced delivery," in which nearly the whole process is conducted by artificial means. It is not to be attempted until at the period of fetal viability, or during the seventh or eighth months. Its intention is to safely deliver the living child, instead of waiting for the natural term, to destroy it by the perforator, and thus expose the mother to much risk; and, also, to save the mother from the hazardous Cesarean operation.

It has been objected, that it is impossible to accurately determine the relative proportions existing between the fetal head and the female pelvis. This is a very trifling objection, and one that should bear no weight at all in the consideration of the question of operating; because these points may be determined with sufficient accuracy for all practical purposes, by the various methods heretofore explained; and should we, even, arrive at a wrong estimate in these measurements, it would be of no great importance; I consider the following reasons, given by Velpeau, as correct, and of much value—he says: "If the pelvis be wider than we thought, premature delivery (at, or after the seventh month), is accomplished without risk. If, on the contrary, the narrowing be more considerable, the fetus will certainly perish; but then, had no operation been attempted till the full term, the fetus would equally have been lost, and the mother would have run greater risk."

But whatever may be the objections raised against this operation, it must always be borne in mind that the results are not so serious to either mother or child, as when pregnancy is permitted to proceed to its full period. Thus, where craniotomy is performed, not only are the infants destroyed, but one in five mothers are lost; where the Cesarean operation is achieved, the children die in the proportion of one in three and a half, and the mothers of one in two and one-third. Where premature labor is effected, more than half of the children are saved, while only one mother in sixteen is lost. In 161 cases of premature delivery, given by Velpeau, eight died, five of which perished from causes not connected with parturition; in 280 cases, given by Figueira, only six were lost. Here, then, are 441 cases of premature delivery, of which only nine died, or about one in fifty. What sane man can, with these results before him, morally or religiously object to an operation so highly favorable to both mother and child?

The induction of premature labor, in cases of malformed pelvis, is to be effected only when the small diameter of the superior strait ranges between two and a half and three inches; under which circumstances it would be impossible for the full developed fetal head to pass naturally, or even with the aid of the forceps. At seven months, according to the researches of several eminent obstetricians, the bi-parietal diameter of the fetal head is from two and a half to two and three-quarter inches, or not quite three inches, and consequently it may pass very readily through a pelvis the smallest diameter of which is contracted to a measurement between two and a half and three inches: a smaller pelvic diameter than this would render the passage of the fetal head impossible even at the seventh month, unless it should be a very small one; but as we have no means of determining this while the fetus is yet within the uterus, the practitioner is necessarily bound to govern himself by the standard measurements as given. The following approximate measurements of the fetal head have been given by M. Figueira, and will undoubtedly be of some utility to the practitioner:

Age of the Fetus.	Bi-parietal Diameter.		Occipito-frontal Diameter.		Occipito-bregmatic Diameter.	
	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.
7th month.	2	9	3	8	2	10
7½ do.	3		3	9	3	
8th do.	3	1	3	10	3	1
8½ do.	3	2	4		3	2
9th do.	3	4	4		3	4

(*See diameters of fetal head, page* 48.)

Ritgen has given a table of some practical value, relative to the time at which premature delivery may be effected; thus it may be induced at the

	Inches.	Lines.
29th week when the antero-posterior diameter of the pelvis is	2	7
30th " " " " " "	2	8
31st " " " " " "	2	9
35th " " " " " "	2	10
36th " " " " " "	2	11
37th " " " " " "	3	0

M. Stoltz has given the bi-parietal diameters of the fetal head to be from the

32d to the 33d week of pregnancy,	2¾	inches.
34th " 35th " "	3⅛	"
36th " 37th " "	3¼	"

The rule given by some authors is, when the antero-posterior diameter of the superior strait measures three inches, to delay the operation until the 38th week or eighth month; when it measures but two and three-quarter inches, operate at 7½ months; and when only two and a half inches, operate at the 7th month. If the diameter is less than two inches, an attempt must be made to save the mother's life either by abortion or the Cesarean operation; and I should not hesitate a moment in resorting to the former method, which every accoucheur must acknowledge as being less hazardous in its results than the latter.

In cases where the antero-posterior diameter of the superior strait is ascertained to be three and a quarter inches, and where in previous pregnancy the fetus could be delivered only by a resort to embryotomy, the practitioner is justified in effecting premature labor; but not in primiparæ, with whom delivery is usually possible, even under such circumstances, and with whom it is not advisable to operate when the diameter measures beyond three inches. And in all instances the practitioner should be well assured of the life of the fetus before attempting the operation, bearing in mind that the longer the child is allowed to remain within the uterus, compatible with its safe delivery, the greater will be the chances in favor of its living subsequently. If the existence of a twin pregnancy be *satisfactorily* ascertained, the operation may be dispensed with, because the development, as well as organization of twins, is usually less perfect than in single pregnancies; but from the difficulty in determining twin pregnancies, this rule will seldom prove of any practical importance.

There are other conditions beside that of pelvic contraction, in which the induction of premature labor may be justifiable; as for instance, in cases of excessive vomiting, where no food can be retained upon the stomach, notwithstanding various remedial agents have been administered, and where consequently the life of the mother is threatened by starvation. It is likewise proper in all cases where the continuance of pregnancy adds to the dangers which threaten the life of the female, as in aggravated diseases of the heart; in aneurism, where, from the obstruction to the general circulation occasioned by the enlarged uterus, a rupture of the aneurismal tumor is feared; in strangulated hernia; in
excessive serous effusions; in convulsions, especially where they
the remedial means pursued and recur frequently, becoming
same time more and more severe; in uterine hemorrhage,
ularly when owing to the attachment of the placenta over
uteri (placenta prævia); in diminution of the bis-ischiat
abdominal or uterine tumors, which interfere with th
the uterus or the delivery of the fetus at full term;
been a rupture of the uterus in a previous labor;
cases where the life of the mother is at stake,

any other means. A dead fetus is not of itself a cause for the operation, unless there be other circumstances of a hazardous character attending it. But whatever may be the nature of the case, it must not be forgotten that the practitioner who attempts this operation assumes a very heavy responsibility, one in which a failure, or a fatal result to the mother, may seriously involve his reputation for a lifetime; consequently, as a general rule, and more particularly among young practitioners, no operation of the kind should be undertaken without a consultation in the matter, and the sanction of the consulting physicians.

Denman says:—"There is another situation in which I have proposed and tried with success the method of bringing on premature labor. Some women who readily conceive, proceed regularly in their pregnancy until they approach their full period, when, without any apparently adequate cause, they have been repeatedly seized with rigor, and the child has instantly died, though it may not have been expelled for some weeks after. In two cases of this kind I have proposed to bring on premature labor when I was certain the child was living, and have succeeded in preserving the life of the children without hazard to the mother. There is always something of doubt in these cases, whether the child might not have been preserved without the operation; but as such cases often come under consideration, and as I am disclosing all that my experience has taught me, it seemed necessary to mention this circumstance." I would remark here that I have seen similar cases, occurring especially after a bleeding for fullness of the head or other unpleasant symptom; but whether they were occasioned by the bleeding I am not prepared to say, but make the suggestion for future investigation: again, I have witnessed a few instances where no bleeding has been performed.

Females sometimes, in a succession of labors, give birth to still-born children, and which is owing, not to pelvic malformity, but to a preternatural energy of the contractions of the uterus, very similar to those induced by Ergot, being permanent, and by constant compression of the cord causing a suspension of the fetal circulation. Premature delivery has been recommended in such cases, with an intention of lessening the energy of uterine action, or a hope of finding it less powerful at the seventh or eighth month, in consequence of which the child may probably be saved. But the operation is not justifiable. The disposition to excessive uterine contraction may be overcome by the employment of uterine tonics and antispasmodics during pregnancy; and anodynes during parturition, with rectal injections of the officinal compound tincture of Lobelia and Capsicum, slightly diluted with warm water, and in very severe and obstinate cases, a portion of this tincture may also be administered internally, or the tincture of Gelseminum.

It can not be denied that there are several difficulties which interfere in a greater or less degree, with the success of the operation; thus, the size of the pelvis may be inaccurately estimated, and the operation be performed at too late a period, or too early, to insure the subsequent existence of the child. Frequently it is almost if not quite impossible to precisely determine the age of the pregnancy, as women are very apt to be mistaken in their calculations, and the results may be similar to those just mentioned above; but, notwithstanding these difficulties, they are by no means of such a nature as to lead us to reject the operation, the results of statistics being greatly in its favor. Again, abnormal presentations, as of the shoulder, breech, etc., are more frequent in premature labors, for which no satisfactory reason has been given, and which generally prove fatal to the child, owing to the constant pressure on the umbilical cord during the passage of the fetal head through the brim; or, where the presentation is natural, the fetus may be destroyed by a long-continued compression of the uterus upon it, owing to the escape of the water and the delay in dilatation of the os uteri. But none of these obstacles are of so grave a nature as to prohibit the operation, because the life of the mother is to be considered as of the first importance, and that of the child as secondary,—to be saved, if possible, but always without endangering the mother.

I would refer here to an ancient prejudice which is still very popular, and is even supposed to be true by many physicians; it is, that a child born at the seventh month is more apt to live, than one born at the eighth month of pregnancy. This, however, is very absurd and incorrect; for we would suppose that the longer the intra-uterine life is extended, the greater would be the chances for a perfect development of organization, and consequently of a subsequent independent existence, and such is actually found to be the case in practice. I am aware that "eighth month children," as they are called, frequently die at a very early age, and I am likewise aware that "seventh month" and "ninth month children" frequently meet with a similar early death; but I have found no peculiar tendency of this kind among those born at the eighth month.

Various methods have been devised and recommended for the premature expulsion of the fetus, some of which may prove safe, as far as the mother is concerned, but are necessarily fatal to the child; while others have in view the safety of both mother and child. The former are seldom employed unless the intention is to produce abortion, previous to the seventh month or viable condition of the child; and it should never be attempted unless the antero-posterior diameter of the superior strait is less than two and a half inches. In these cases the question is between abortion and the Cesarean section; by the former the child is delivered dead, while the hazard to the mother is comparatively small; by the latter, the child has one chance in three of living, while the mother has but one in two and a quarter chances of recovering from the operation. Shall we then sacrifice the child to save the mother, or the mother to save, probably, neither? My own view of the matter corresponds with that of Velpeau, who says: "As regards myself, I avow I can not put in comparison the precious life of a fetus of three, four, five or six months, a being scarcely differing from a plant, one that is bound by no ties to the external world, with that of an adult woman, whom a thousand social relations interest us to save; therefore, in a case of extreme narrowness of the pelvis, and where it was mathematically demonstrated that delivery at the full period was impossible, I would not hesitate to recommend producing abortion in the first months of gestation."

Abortion may in some cases be effected by warm pediluvia, copious sweating, and drastic purgation, while in others these will produce no influence at all; indeed many unchaste females are in the habit of producing abortion in the early months of pregnancy whenever this takes place, by such means as named above, yet it is generally accomplished at a great sacrifice to both health and long life. The oil of Savin given in doses of ten drops on sugar, and repeated three times daily for a week or two, will cause abortion, especially in the early months of gestation, in consequence of its destructive influence upon the ovum, yet it frequently fails, and if given in larger quantities is very apt to produce serious inflammation; its action appears to be more positive in females of a strumous diathesis. Borax and Cinnamon in doses of five grains each, or a mixture of Borax and Ergot, each, in powder, ten grains, powdered Cinnamon one scruple, administered three times a day, will likewise often occasion abortion, by their influence upon the contractile tissue or action of the uterus, yet these compounds sometimes produce irremediable and distressing symptoms. Many other agents have produced abortion, as various essential oils, or infusions of emmenagogue herbs, with or without the addition of Yeast, etc., but none of these can be recommended as invariably certain in their results, beside which, they often produce disastrous consequences.

Probably the safest as well as most certain method is the one pursued by Macaulay in 1756—perforation of the membranes by the introduction of a catheter or a canula armed with a trocar; the instrument is introduced into the os uteri, and the membranes pierced by it, care being taken not to injure the parts of the mother. This method is neither painful nor injurious to the mother; by it, the amniotic liquid escapes, the uterine walls retract, dilatation of the os uteri more or less slowly ensues, requiring from twenty to forty hours, and in some instances even sixty; the uterus, irritated by the constant proximity of the fetus, contracts, but is unable to expel its contents until the os uteri has become sufficiently dilated, hence there is frequently excessive hemorrhage from an early detachment of the placenta. This method has been also advised to induce premature delivery, but it should never be adopted after the seventh month, as from the early discharge of the waters and consequent prolonged pressure of the uterus upon the fetus, its life is greatly endangered.

The above methods are among those which have been used at various times for the purpose of producing abortion, but in instances where it is required to save the life of the child, if possible, that is, after the seventh month, other measures have been recommended, among which may be mentioned the following:

1. Frictions over the fundus uteri to induce contractions, at the same time titillating or irritating the os uteri by one or more fingers introduced into the vagina, has been proposed by D'Outrepont and Ritgen; this plan, however, is rarely employed, because it seldom effects any uterine contractions, and when these do occur, they are too feeble and evanescent to produce an expulsion of the fetus.

2. It has been suggested by Dr. Hamilton, to introduce a finger or gum-elastic catheter beyond the inner os uteri, and separate the membranes from the internal uterine surface for some two or three inches around, and where labor can be brought on by this mode, it is safe to both mother and child. But it can not be relied upon as an efficient measure, and in cases where it has succeeded, the result was probably brought about by the irritation produced at the cervix.

3. M. Meissner, of Leipsic, has given a plan by which he assures us that, in fourteen cases upon whom it was tried, both mother and child were saved in every instance; it is an improvement upon the method of Macaulay, and has for its object the gradual discharge of the amniotic liquid, thereby avoiding long-continued pressure upon the fetus. The plan is to puncture the membranes, not at their lowest part, but high up, as near the fundus uteri as possible; and the instrument he

employs is a canula about thirteen inches in length, and two lines in diameter, and having a curve corresponding with the segment of a circle whose radius is eight inches. Attached to this canula are two stilets, one bearing at its extremity an olive-shaped button, the other a trocar; a ring is also placed upon the lower extremity of the convex side of the canula, which enables the operator to determine the direction of the curvature when the instrument is within the uterus. The female being placed in an erect position, the operator, stooping down on one knee, proceeds carefully to introduce the canula armed with the olive-shaped button through the os uteri, and as far up between the membranes and uterine walls as possible, say six, eight, or ten inches above the os uteri. This having been accomplished, and also having ascertained that the point of the canula is not in contact with any part of the fetus, the button stilet is withdrawn, and that with the trocar introduced and the membranes punctured. Sometimes, when the cervix is high up, and looking so far backward as to be reached with difficulty, the female will have to sit on the edge of a chair, or assume the recumbent position, in order to enable the practitioner to introduce the canula. After the perforation of the membranes, the trocar-stilet is removed, a small portion of fluid is permitted to pass through the canula, and then this is also withdrawn. The waters by this mode escape gradually, pains usually come on in twenty-four or forty-eight hours, and labor is finished in from thirty-six to sixty hours. This operation has not been very extensively employed, but is preferable to any of the plans heretofore named.

4. Kluge has proposed a mode of inducing uterine contractions without puncturing the membranes, by the introduction of sponge within the os uteri. The sponge must be soft and fine, of a conical shape, about two inches long, and half an inch in diameter at its base, and a piece of tape must be attached to its base, by means of which it may be removed when required. It may be prepared by soaking a piece of fine sponge in a solution of Gum Arabic, wrapping it round an awl, and tightly binding it on by a string; when dry, it can be cut into any required shape. The female, for a few days previous to the operation, is directed to use the warm-bath, and warm emollient and narcotic vaginal injections; and before introducing the sponge, both the rectum and bladder are to be emptied. She is then to be placed in a position somewhat similar to that required for the application of the forceps, and the finger of the operator is introduced into the vagina as far as the os uteri to serve as a conductor; with the other hand, a long pair of forceps, holding the piece of sponge, is to be passed along the conducting finger and gradu-

ally entered within the canal of the cervix. After holding it there for a few minutes the forceps are to be withdrawn, and the sponge kept in its place by filling the vagina with a large sponge, or pieces of linen, and the whole retained by a proper bandage; the patient is then directed to remain in bed. The fluids of the parts saturate the sponge, which swells up, and consequently dilates the os uteri, and irritates its fibers, which, reacting upon those of the corpus uteri, effects contractions, which usually occur in five or six hours. If in the course of twenty-four hours, active contractions of the uterus are not excited, the sponge must be removed by means of the tape, and a new and larger piece inserted in its place; this second application is most generally successful. If required, the labor-pains may be increased by titillating the cervix, frictions over the abdomen, and the use of (Caulophyllin or) Ergot. This plan is certainly preferable to that of puncturing the membranes, yet, it is stated to fail occasionally.

Professor Kiwisch, of Würzburg, recommends the direction of a stream of warm water from a hight, by means of a syphon, continuously upon the os uteri; Dr. Smith proposes to improve upon this method by alternating the temperature of the douche from hot to cold. A vessel capable of holding two gallons of water is placed at an elevation of four or five feet above the patient, to which is affixed a flexible tube about eleven feet in length and half an inch in diameter, the uterine extremity of which terminates in an ivory or bone nozzle five or six inches in length, or is connected with the straight tube of an injecting apparatus, and near the upper end of which a stop-cock is attached. In employing this, two gallons of warm water, about 110° F., are to be placed into the vessel. The uterine extremity of the tube is then passed into the vagina and directed toward the os uteri, the female being in bed, or in an empty hip-bath; holding the tube steadily, the stop-cock is turned, and the stream immediately commences flowing with considerable force against the os uteri, and which is to be continued until the whole two gallons have been discharged. If this is to be followed by a cold douche, the same quantity of cold water is to be poured into the vessel as soon as it is emptied, and allowed to flow in the same manner. The time occupied in the operation is from twenty to thirty minutes, and the only disagreeable sensations experienced are when the warm and cold currents first begin to run. This operation may be repeated two or three times daily, requiring its application from two, to four, eight, or twelve times. It is to be preferred to all others yet named, as its application is simple, and no possible injury can be done to either the mother or child. If expedient, it should be performed at the period in which the catamenia would have appeared in the non-pregnant condition. A syringe capable of maintaining a continuous stream may be substituted for the vessel and tube.

6. The employment of galvanism or electro-magnetism, as suggested by Herder in 1803, has been found efficacious in bringing on uterine contractions, even after other means had failed. This is accomplished by placing one pole of the battery on either side of the uterus, continuing the application of the current for half an hour or an hour each time, and renewing it once or twice daily; the ordinary electro-magnetic apparatus in use is the best form, as repeated shocks prove more effectual and certain in stimulating the uterus to contractions than a continued current. In applying the poles it will be proper to attach to the discs a sponge moistened with water, or salt and water; or pieces of thin flannel likewise moistened may be placed between the discs and the abdomen. Some apply one pole to the neck of the uterus, and the other to the spine or abdomen, immediately above the fundus; but this is unnecessary. Dr. Radford states, "that galvanism not only originates the temporary contractions of the uterus, but also produces such a lasting impression on the organ that pains continue to occur until the labor is terminated. It produces severe pains in the loins, and great bearing down, followed by dilatation of the os, and expulsive pains." I have employed this agent in a few cases, and with invariable success, though the number and intensity of the applications had necessarily to be varied in each. In relation to its influence on the fetus, Dr. Radford, who has made extensive employment of it in midwifery, states that he has never observed that the child in utero has been injured by its use, which gives it a great advantage over the administration of secale cornutum, which, in many cases, is destructive of it; he also remarks, "Galvanism is especially advantageous as a general stimulant in all those cases in which the vital powers are extremely depressed from loss of blood. Its beneficial effects are to be observed in the change of countenance, restoring an animated expression; in its influence on the heart and arteries; in changing the character of respiration; and its warming influence on the general surface. I have several times observed, in cases in which other powerful stimulants have failed to produce any beneficial results, the most decided advantages accrue after its application." It may likewise be employed to effect abortion, when the indications show the necessity, or justify the expulsion of the ovum.

7. The Inner Bark of the Root of the Cotton plant is stated by Dr. Bouchelle to have a particular affinity for the sexual organs, modifying

their functions in a remarkable manner; that it not only possesses oxytocic properties, invigorating feeble contractions of the uterine fibers, but that it *originates* expulsive contraction at any period of gestation, and will induce *immediate* abortion when taken in the proper quantity, and without any detriment to the health of the female. He states, also, that it is habitually resorted to by slaves in the South as an ecbolic for the criminal purpose of inducing abortion, a fact which I have had named to me a number of times by Southern practitioners. Dr. B. infers, from its influence on females, that the use of it destroys the generative capacity, rendering the person sterile, without impairing the health; should this eventually prove to be the case, the bark of cotton root will become a most important article of our Materia Medica, a boon to physicians, and likewise to females with deformed pelves; and it is to be desired that its value in this matter will be thoroughly investigated. It is used in strong decoction as an ecbolic or oxytocic, of which four fluidounces may be taken every twenty or thirty minutes until the desired result is obtained.

After uterine contractions have been fully established by the adoption of either of the above measures, to induce premature delivery, the labor will proceed in the same manner as at full term, and its management, as well as that of the placenta, will also be the same as recommended at that period. As a prematurely delivered child is more feeble than one fully developed, some care will be required in its management; it should be kept warm, allowing it, however, a free use of its limbs, and a wet nurse should always be provided for it, who should be directed to adopt a system of regularity in applying it to the breast, at no time allowing it an excess of aliment.

PART V.

DISEASES INCIDENT TO PUERPERAL FEMALES, AND INFANTS.

CHAPTER XLVII.

PUERPERAL FEVER—PERITONITIS—INFLAMMATION OF THE UTERINE APPENDAGES—METRITIS—UTERINE PHLEBITIS—INFLAMMATION OF THE UTERINE ABSORBENTS—TREATMENT OF PUERPERAL FEVER.

ONE of the most dangerous forms of disease to which the puerperal woman is liable, is that commonly known as PUERPERAL, or CHILD-BED FEVER—concerning which there have been, from time to time, various and discordant opinions expressed by medical writers, as well as sundry modes of treatment recommended, each being based upon the particular theory supported by its originator. This clashing of views has, perhaps, originated from the fact, that the malady termed puerperal fever, has included several phenomena which have not been uniform, and which have yielded to the most opposite plans of treatment—and, each writer being entirely governed in his opinions upon the subject, by the particular symptoms and circumstances presented to his individual notice, has, probably, been induced to infer that, while others have mistaken the true nature of the disease, he has correctly ascertained it, together with the best treatment for its cure. At the present day it is generally acknowledged that the malady varies in its pathological characteristics.

Puerperal fever, has, heretofore, proved very fatal in its result, destroying a large majority of those who have been attacked by it, and has undoubtedly occasioned more than two-thirds of the deaths which have occurred among females at the puerperal period. It is more malignant in hospital, than in private practice, which may be owing to the congregation of too many patients in a ward, as well as to a neglect of proper ventilation, and thorough and constant cleanliness of the various lying-in apartments. The poorer classes of society, from their indigent mode of living, and the illy-ventilated, unclean, and damp rooms, which their circumstances compel them to occupy, are more subject to the disease than those who can obtain the proper necessaries and conditions for health, and it also proves much more fatal among them.

The attack commonly occurs within two or three days after delivery, but it has been met with previous to labor, and also at the third or fourth week succeeding it; and when it does occur, it usually runs its course speedily.

CAUSES.—Puerperal fever most generally prevails as an epidemic, and it is not uncommon, at epidemical seasons, to observe that nearly every puerperal woman within the abnormal district, suffers from an attack. This may be owing to the great susceptibility which the parts must have to diseased action, arising from the nervous shock, the sudden evacuation of the abdominal cavity, the powerful contractions of the uterus and abdominal muscles, and other circumstances connected with labor; indeed, when we consider all the phenomena present during the birth of a child, and more especially in difficult, and instrumental labors, it is rather a source of astonishment, that the disease is not still more frequently met with. When occurring as an epidemic, it is more malignant and fatal in its character than when it exists spontaneously, and those females more readily fall victims to it, who are exposed to any of the causes hereafter assigned for its spontaneous advent.

Independently of any epidemic origin, puerperal fever may be produced by an exposure to cold, or to dampness; by an omission of the bandage; by the female arising from her bed at too early a period; by allowing her improper food, or stimulants, during the first puerperal week; by violent emotions of the mind, whether of a depressing or exciting character; by a retention of portions of the placenta; and, notwithstanding that venesection is frequently recommended as a means to overcome the disease, yet we find that it frequently follows excessive floodings. I have several times noticed a disease resembling it to follow a constipated condition of the bowels, in cases where the attending accoucheur had permitted the patient to remain without any alvine evacuation for ten or twelve days. Manual and instrumental labors render the puerperal female especially obnoxious to this disease. And frequently it is impossible to assign any satisfactory cause for its origin.

The malady occurs more frequently, and with greater malignancy in cold seasons, and during damp, or moist conditions of the atmosphere, while in warm and dry seasons it is less common, and more favorable in its results.

Much has been said about the contagious, or non-contagious character of puerperal fever; some of our most eminent medical men maintaining that it is decidedly contagious, and others, equally as distinguished, supporting an opposite opinion. It is a very difficult matter to satisfactorily determine this question, because the extension of the disease, during its epidemic existence, may be safely attributed to its epidemic nature; while, on the other hand, instances have occurred which so strongly manifested a contagion, or an extension without epidemic influences, that, to say the least, it would be exceedingly impolitic to make any positive declarations relative thereto. Perhaps, there may be some forms of this disease, as for instance the erysipelatous, which may be communicable, even when it occurs spontaneously; while other spontaneous forms are, probably, never contagious; the subject requires still further investigation.

I can not, however, divest myself of the opinion, that it is a contagious disease, especially the typhoid and erysipelatous varieties; for, notwithstanding the statements and reasonings of those eminent gentlemen who favor the side of non-contagion, I have witnessed so many instances in which its existence could be accounted for in no other way than by contagion, that other explanations than those I have met with will be required to change my views on this subject. In the present unsettled condition of this question, whatever may be our opinions, I believe with Dr. R. Lee, "that it is our duty to act in all cases as if the contagious nature of the disease had been completely demonstrated." The accoucheur who is attending a case of puerperal fever, should, for a season, avoid waiting upon any parturient females; he should likewise forbid the presence of pregnant women within the apartment of his patient, as instances have occurred, where the only assignable cause for the attack, was the presence of the female, during pregnancy, in the room of a child-bed-fever patient. It is likewise stated by some authors, that a similar exposure of the non-pregnant female, during the catamenial period, has occasioned fever of a somewhat similar character.

The several varieties of puerperal fever, are classified according to the pathological conditions which are present, and may be described as follows:

1. *Peritonitis*, or inflammation of the uterine peritoneum, and peritoneal sac.

2. *Inflammation of the uterine appendages*, as the ovaries, Fallopian tubes, and ligaments.

3. *Metritis*, or inflammation of the mucous, and muscular, or proper tissue of the uterus.

4. *Uterine phlebitis*, or inflammation and suppuration of the veins of the uterine organs.

5. *Inflammation of the uterine absorbents.*

I. PERITONITIS, of the lying-in female, is usually ushered in with rigors, more or less severe in their character, and which are preceded, accompanied, or followed by uterine tenderness, or pain. The rigors may be very slight, scarcely perceived by the patient, or they may be very violent, resembling an attack of intermittent fever, with coldness of the extremities. The pain, however slight it may have been at first, gradually increases in severity, at the same time extending itself over the abdomen. In the early part of the disease it may be mistaken for after-pains, but may be determined from them, by making pressure, during the intervals, over the iliac and hypogastric regions—if no pain or soreness is produced, there is no peritonitis. But if the pain has obstinately persisted for several days, with symptoms of constitutional disturbance, there will be strong reasons for suspecting a lurking inflammation. Commonly, when pressure is made over the regions just named, the patient being attacked with peritonitis, will complain of pain. Cases, however, are recorded in which the most severe form of puerperal peritonitis existed, without any tenderness or pain in the abdominal region.

The rigors pass away after a short period, and are followed by febrile symptoms, as flushed face, great heat of the surface, thirst, sometimes nausea and vomiting, short and hurried respiration, and an intense pain across the forehead. The pulse, during the rigor, is usually full, strong, and accelerated, beating from 110 to 140 in a minute; but as the disease progresses, it loses its hardness and volume, and becomes more frequent, small, and wiry, beating from 130 to 160 and upward in a minute; and in all cases when the pulse of a puerperal female remains persistently above 100 beats in a minute, it is good evidence of the existence of some abnormal action. The tongue is usually covered with a thin, moist, white or cream-like film, but red at the edges; and sometimes the whitish film is absent, and the whole surface of the organ is red. As the disease progresses, the coating becomes yellowish or brown, and occasionally there will be a dryness of the tongue, with a brownish coat from the commencement. The lochial discharge may be completely suppressed, or only lessened in quantity, and occasionally it continues to flow as usual. The secretion of milk is most generally suspended, and the mammæ become flaccid. The urine is scanty, turbid, or high-colored, with more or less difficulty in voiding it. Obstinate constipation is generally present in the early part of the disease. The countenance of the patient is peculiar, after the disease has formed itself completely, presenting a ghastly, pallid, anxious, and suffering appearance, with a livid hue under the eyes. Sometimes a crimson patch will be observed on one or both cheeks, which is an unfavorable symptom.

At the onset of the disease the abdomen is generally soft and flaccid, but becomes swollen and tympanitic as the disease advances. From the commencement of the attack, any motion of the lower limbs will occasion more or less pain: when this is severe, the patient usually lies upon her back, with the knees drawn up to the abdomen; which posture she retains on account of the pain caused by extending them. The pain eventually becomes so intense that she is unable to bear the least pressure upon the abdomen; the bandage will have to be loosened or removed altogether, and frequently the hands will be employed in holding up the bedclothes to remove their weight from the suffering parts. The least motion, as turning on one side, coughing, etc., occasions great suffering, in consequence of which she lies remarkably still, manifesting her distress and uneasiness by screams and moans, by throwing her arms about, and occasionally turning her head from side to side. With the tympanitic condition of the abdomen the pain will become more aggravated, or it may entirely subside. The patient will frequently be indifferent to the welfare of her infant, even refusing to give it suck.

As the inflammation extends throughout the abdominal organs, the tympanitic condition of the abdomen increases; the vomiting, which was at first mucous or bilious matter, becomes green, brown, or blackish, like coffee-grounds; the evacuations become dark and fetid, or a diarrhea may be present, which is an unfavorable symptom; the skin becomes cold and clammy; the pain ceases, an evidence that effusion has taken place; if the diaphragmatic peritoneum has been involved in the inflammation, hiccough takes place. Generally, the female retains her senses until near the end of the disease, when low, muttering delirium ensues, with carphologia, or picking at the bedclothes; the lips, hands, and feet become purple; the pulse gradually diminishes, ceasing at the wrist, elbows, and the axillæ, when death speedily closes the scene.

All the symptoms named will not generally be found in any one case; perhaps the most uniform among them is the frequent pulse. This, together with rigors, pain, vomiting, and tympanitis, are more commonly observed.

DIAGNOSIS.—It is not a very easy matter to determine between the varieties of uterine inflammation, in puerperal fever, as the symptoms, in a great measure, bear some resemblance; nor, in a practical point of view, is it of much importance, as the treatment in each of them, whether existing singly or combined, will be nearly the same. Yet it will be proper, notwithstanding, to name some of the distinguishing marks between peritonitis and other disorders, for which it may sometimes be mistaken.

It may be determined from *hysteralgia*, or *after-pains*, by observing that in these there is but little tenderness on pressure during the absence of the pains; that the uterus perceptibly contracts and hardens when they are present, which is not the case with the peritonitic pain; and that the pains diminish from day to day, while that of peritonitis rapidly augments. The pulse is frequent, in puerperal fever, and but seldom so in hysteralgia; and when this is the case, unlike the pulse of peritonitis, it soon falls to a normal condition. In peritonitis, the disturbance to the general system increases every day, while in hysteralgia it gradually ceases.

Intestinal irritation, from depraved secretions or fecal accumulations, is frequently mistaken for puerperal fever. This difficulty generally attacks at a later period than peritonitis, and does not occasion so much constitutional disturbance. The pain in the abdomen is equally diffused, and does not spread from a focus; the uterus is not tender nor enlarged; the abdomen is soft and puffy, not tympanitic, nor does pressure aggravate the pain to any extent, and the patient can more readily move in bed. In each there may be chills, heat of skin, headache, rapid pulse, loaded tongue, flatulence, nausea, vomiting, and diarrhea or constipation. Intestinal irritation is said to be frequently confounded with peritonitis, and is supposed to be the reported "violent cases of peritonitis in which the patient dies between the stage of excitement and of effusion, and no effusion or signs of inflammation are found."

In *metritis* or *hysteritis*, but little pain is produced on pressing the abdominal parietes until the enlarged uterus is touched, while in peritonitis, the least degree of pressure on the abdomen causes severe pain. The other symptoms of metritis are less general than those of peritonitis.

POST-MORTEM APPEARANCES.—The peritoneum, especially that portion covering the uterus, is red, vascular, thickened, and sometimes softened, and is frequently covered with a layer of lymph, resembling a false membrane, which occasions adhesions between the omentum and intestines, and sometimes between the omentum and fundus uteri. The redness will be the more intense, and the thickening of the peritoneum the greater, in proportion to the duration of the pain and the severity of the disease. The omentum frequently exhibits marks of inflammation, being red and highly vascular; and this may be found without any evidences of inflammation of the peritoneum. The serous coverings of the several organs, in the cavity of the abdomen, may exhibit evidences of inflammatory action. A turbid, whey-colored, or red serum, with purulent or albuminous shreds floating in it, or a yellowish lymph, are effused, in greater or smaller quantity, into the peritoneal cavity, and sometimes blood will be found, alone, or mixed with the serous fluid. Pus is frequently found deposited behind and around the uterus, beneath its peritoneal covering, and at those points where the inflammation has appeared to be the most active.

II. INFLAMMATION OF THE UTERINE APPENDAGES, may exist in conjunction with inflammation of the peritoneal covering of the uterus, or it may occur entirely independent of it: more frequently, however, they are met with together, and when this happens, the symptoms common to peritonitis will be present, with the addition of those which belong to inflammation of the appendages.

When the serous membrane and proper tissue of the ligaments, Fallopian tubes, and ovaries are attacked with inflammation, while the peritoneal sac is but slightly affected, or not at all, the pain will be located principally in one of the iliac fossæ, extending from thence to the groins, anus, and down the thighs. On making pressure, the pain will be experienced in the lateral portions of the hypogastrium, and will be less intense than in general peritonitis. An examination per vaginum will find the upper part of this canal hot and painful. The constitutional symptoms are similar to those of peritonitis, as rigors, hot skin, thirst, headache, frequent pulse, etc. When the attack is severe, prostration takes place rapidly, and the disease may speedily prove fatal. Or, it may terminate in *resolution*, without injury to the organs; with obliteration of one or both of the Fallopian tubes; or with adhesions between the tubes and parts in proximity, or of portions of serous membrane, and which may subsequently prove injurious.

Or, it may terminate in *suppuration*, matter being formed in the ligament or ovaries, and escaping into the peritoneal sac; through the vaginal or rectal walls; or, through the walls of the abdomen in the neighborhood of Poupart's ligament.

POST-MORTEM APPEARANCES.—The surface of the Fallopian tubes, ovaries, and broad ligaments, are red and vascular, and are imbedded to a greater or less extent in pus or lymph. The fimbriated extremities of the tubes are of a deep-red color, and frequently softened, and diffused or circumscribed deposits of pus may be observed beneath their coverings, and in their cavities. Effusions of pus or serum may likewise be found between the folds of the broad ligaments, and small masses of pus will be met with, dispersed throughout the enlarged ovaries; or these organs may be converted into a cyst holding pus, which escapes through ulcerated openings. One or both of the ovaries may exhibit evidences of inflammatory action, their peritoneal coat being red, vascular, and imbedded in lymph. They may be greatly enlarged, swollen, red, and pulpy, or there may be no apparent change in their parenchymatous structure. On dividing the ovaries, a great augmentation of vascularity will be seen, with a softening, or complete disorganization of its proper tissue. Occasionally, there will be an effusion of blood into the Graafian vesicles, destroying their texture.

III. METRITIS, HYSTERITIS, or INFLAMMATION OF THE UTERUS, commences most commonly on the third or fourth day after delivery, with rigors, followed by a hot and dry skin, thirst, headache, accelerated pulse, dry and furred tongue, with pain and tenderness in the uterine region, though pressure upon the abdomen occasions no pain until the hand and enlarged uterus is reached. The abdomen, at first soft, becomes tympanitic, and if the proper remedies are withheld the inflammation may extend to the peritoneum, when the pain will spread over the abdomen, being attended with the symptoms peculiar to peritonitis. The lochial discharge may be diminished or suspended, and may remain unchanged, or become of a dark color, and very fetid. The secretion of milk is generally defective; the urine is scanty, occasioning much pain when voided. A vaginal examination will find the os uteri very hot and tender.

In the more severe attacks, the above symptoms will exist in an augmented degree, with a pale countenance expressive of pain and great anxiety. The skin frequently becomes cold assuming a sallow or bluish tinge. The pulse becomes rapid and feeble; the respiration hurried and distressing, with excessive prostration of strength. The pulse is more feeble, and the patient becomes more speedily prostrated, than in peritonitis.

If the disease progresses without amelioration, the tongue becomes coated with a dark or brown fur; the teeth and lips covered with sordes; the extremities become cold, with cold and clammy perspiration; vomiting is most usually present, and also an obstinate diarrhea, the strength fails rapidly, with coma, or low muttering delirium, subsultus tendinum, and death. Metritis may terminate in resolution, abscess, softening, or gangrene; the milder varieties in the first-named, and the more severe in one of the latter.

POST-MORTEM APPEARANCES.—The uterus will be found enlarged, and its substance soft and flabby, presenting a dark purple, grayish, or yellowish pulp, sometimes of a very offensive odor, and which may exist in patches, or occupy a large tract of the organ. The softening generally proceeds from the inner uterine surface, and extends through involving the peritoneal covering. Frequently there will be extensive disorganization of the muscular tissue of the uterus, without any change in the character of the peritoneal coat. All parts of the uterus may be attacked by inflammation and softening, and, frequently, that portion to which the placenta was attached is alone found to be disorganized. Coagulable lymph forming false membranes, and mixed with blood, and lochia, are also found on the inner mucous membrane; and in a few instances, instead of a complete disorganization of the muscular tissue of the uterus, small abscesses containing pus have been found in this tissue.

The peritoneum, covering the inflamed part of the muscular coat of the uterus, very often presents evidences of inflammatory action; it may be red, yellow, or livid, having a deposition of lymph on its surface, or without this, but so softened in its texture as to be readily torn.

IV. UTERINE PHLEBITIS, or inflammation of the veins of the uterus, may be produced by any of the causes that occasion the other forms of puerperal fever. The symptoms are similar to the preceding attacks, as rigors succeeded by hot skin, thirst, accelerated pulse, headache, etc., together with pain in the uterine region, which is much increased on pressure, and a suppression of both the lochial discharge and the secretion of milk. Frequently a confusion of mind, or incoherency will be observed.

The disease progresses very rapidly, the symptoms augmenting in intensity; rigors will frequently be present, especially during the early part of the attack, succeeded by an increased heat of the surface, the tongue becomes dry and brown, with insatiable thirst, rapid, full pulse, hurried respiration, vomitings of a greenish fluid, tremors of the muscles of the face and extremities, excessive drowsiness, or violent delirium. The body becomes of a deep sallow color, and sometimes petechiæ, or vesicular eruptions will be seen on various parts of it. The abdomen is frequently swollen and tympanitic, and the tenderness in the uterine region is increased; occasionally, no pain is present.

Death may take place during the acute stage, or the patient may recover from the primary attack and have her life shortened by secondary affections of other parts, as for instance: congestion of the vessels of the brain, and deposition of lymph or serum into the ventricles; arachnitis; softening of portions of the brain; or deposit of pus into the cerebral substance. Congestion of the lungs, or disorganization of their substance; pleuritis; effusions of serum or blood; gangrene, etc. Hypertrophy of the heart with softening, and occasionally depositions of lymph and serum in the pericardium. Inflammation and softening of the mucous coat of the stomach; effusion of reddish serum between its mucous and muscular tissues. Softening and perforation of portions of the intestines. Congestion, softening, or abscess of the liver, or of the spleen. Inflammation of the kidneys, with depositions of pus, softening, etc. Inflammation of the conjunctiva, with effusion of lymph in the anterior chamber, destroying sight. Inflammation of the joints, with abscess, and infiltration of a sero-sanguineous fluid into the muscles or cellular substance of the limbs, presenting the appearance of erysipelas. Sometimes abscesses form, discharging enormous quantities of pus, rapidly prostrating the patient.

DIAGNOSIS.—This is very difficult to distinguish from the preceding varieties, especially during its early stage. The pain and tenderness is more confined to one spot than in peritonitis, and when the disease has continued for some time, the secondary affections will manifest themselves.

POST-MORTEM APPEARANCES.—The uterine veins are found changed, having their coats thickened, and their canals frequently so closely contracted as to be almost, if not quite impervious; and their lining membrane will be pale and covered with lymph or pus, frequently it will be of a bright scarlet color. Similar conditions will be found when distant veins are involved, with a hardening of the surrounding cellular tissue, which contains depositions of pus. Most commonly the inflammation is confined to the veins of one side only, and which is the side corresponding with that of the placental attachment. Occasionally the veins will be plugged up with firm coagula, or other abnormal substances. Beside the uterine veins, the spermatic are more frequently affected—and the disease may extend rapidly to the hypogastric veins. The renal veins are generally involved, with a soft and vascular condition of the substance of the kidney.

V. INFLAMMATION OF THE UTERINE ABSORBENTS, or Lymphatics, presents all the symptoms common to uterine phlebitis, from which it is almost impossible to distinguish it. It is likewise followed by secondary affections similar to that disease.

POST-MORTEM APPEARANCES.—Pus is found at different points of the lymphatics, generally at nearly regular intervals, presenting a beaded appearance.

PROGNOSIS.—These several varieties of puerperal fever may exist singly or combined, more frequently the latter; and as their symptoms so closely resemble each other, when combined it will be a difficult matter to positively distinguish between them, yet in a practical view, as before related, this is of minor importance, the treatment being the same.

The prognosis is always unfavorable, and especially when the disease occurs epidemically. The most unfavorable symptoms are suppression of the lochia, tympanitis, delirium, vomiting of greenish, or "coffee-ground" substances; very high pulse, or thready and fluttering; hiccough; diminished pain on pressure, with increased ability to move the legs, and a frequent, feeble pulse, evidencing that the inflammation has terminated in effusion; cold, clammy skin; diarrhea, or involuntary stools; and dilated pupils. The most fatal period is during the third or fourth day.

But if, with an ability of the patient to move herself in bed, we find the pulse to lessen in frequency, the skin to become cooler and softer, the thirst gradually diminishing, the tongue cleaning, the bowels being more easily acted upon, the clearness of the skin returning, and the patient more able to make a deep inspiration, and to obtain refreshing sleep, we may augur favorably. The ability to change position without much pain, is frequently one of the first symptoms of improvement. Yet, even with all these favorable indications, we must not cease in our close attentions to the patient, for it has happened, that when there was every indication of a favorable result, and physicians and friends were congratulating each other relative thereto, that the symptoms have returned with increased severity, and the attack has terminated fatally.

TREATMENT.—It is seldom that puerperal fever has exactly the same features, each epidemic presenting symptoms peculiar to itself. If we admit only the five varieties of the disease, as described above, and which may occur separately, or in various combinations with each other, we have then, twenty-six different modes of manifestation, in which there will be a great diversity of symptoms, in number, character, and severity. But, when, as is frequently the case, it prevails simultaneously with erysipelas, we may then have an additional number of twenty-six, giving to us fifty-two different features which the disease may present; and, probably, this fact may lead us to suspect the reason why writers have given such varied descriptions of it, as having occurred under their respective observations.

However formidable a disease may at first appear, which is capable of presenting so great a number of differences in its features, yet, for practical purposes, they may be reduced to two conditions, viz: that in which the *inflammatory symptoms* predominate, and that in which the *typhoid symptoms* prevail. And the treatment must be governed by the presence of one or the other of these conditions. The most important object is, to overcome the congestion and inflammation of the parts attacked, and bring about resolution — for if the disease terminates in effusion, the woman almost certainly dies.

In the INFLAMMATORY FORM of puerperal fever, when called at an early stage of the attack, the bowels should be immediately purged by an active cathartic. In this affection, I prefer the compound powder of Jalap, sixty grains, combined with ten or fifteen grains of bitartrate of Potassa. Some practitioners, however, administer Podophyllin, Leptandrin, and the bitartrate, or nitrate of Potassa, but I do not like the action of Podophyllin in this disease so well as that of the first named cathartic. As it is very important, in this disease, to keep the bowels regularly open, the cathartic must be repeated daily, for the first two or three days, according to the strength of the patient, after which, the bowels should be kept free, obtaining one or two moderate evacuations daily by injections or mild laxatives. It will often happen that the cathartic will not operate until two or three fluidrachms of compound tincture of Lobelia and Capsicum, diluted with a warm infusion of Lobelia, have been injected into the rectum. The evacuations of the bowels and bladder should be accomplished without subjecting the patient to the distress and annoyance of getting up in the bed, or out of it, either by using a bed-pan, or some old cloths. Indeed, it is much better for her to keep in the recumbent posture, and without elevating the head and shoulders by pillows.

It will not be necessary to wait for the catharsis, but endeavor to get the patient as soon as possible under the influence of the tincture of Gelseminum, which may be given in fluidrachm doses, and repeated every hour. If much pain be present, the tincture of Aconite may be added, from three to five or even ten drops, to each dose of the Gelseminum.

As soon as the cathartic has accomplished its effect, and the more severe inflammatory symptoms have subsided, the compound tincture of Virginia Snakeroot should be substituted for the Gelseminum, and may be given in fluidrachm doses every hour or two, until copious perspiration is produced; it is best given in a warm infusion of some simple herb, as pleurisy root, catnip, tansy or balm. Previous to the administration of this, however, the surface of the body should be bathed with a warm alkaline solution, drying it with considerable friction, and this should be continued from time to time during the persistence of the inflammatory symptoms. Diaphoresis once produced, it must be kept up during the acute stage, occasionally exhibiting the Gelseminum when the inflammatory symptoms increase in severity.

Equal parts of the tinctures of Digitalis and Stramonium, given in doses of ten or fifteen drops, every hour or two, have frequently been of advantage in this disease, particularly when the attack was mild.

Fomentations applied over the abdomen, as hot as can be borne, will be found a powerful means for relieving the pain and soreness in that region; they may be made of hops and tansy, or hops and poppy heads, or either of these with chamomile flowers, and they should be renewed frequently, not permitting them to remain on when cool, and the patient should not be made uncomfortable by applying them so wet as to dampen the bed upon which she lies. For a fomentation to the bowels I know of no agent equal to the leaves of Stramonium, which are now being used in various inflammatory affections, by some of my colleagues, upon my recommendation, and with much success; I have used these when fresh, by bruising and warming them previous to their application, or, by steeping the dried leaves in boiling water, and frequently changing them upon the abdomen. I have persisted in the appliance of this remedy even after it has caused double vision and other symptoms of its peculiar narcotic influence upon the system, and, *invariably* with benefit. It not only lessens pain, but actually assists in reducing the inflammatory action. When its effects upon the system are no longer desirable, one of the previously named fomentations may be substituted. The fomentations will prove beneficial only during the acute stage, and must be dispensed with when prostration ensues, or when the inflammation has been overcome. The addition of oil of Turpentine to them, when tympanitis is present, has been found useful.

For a common drink the patient may take an infusion of Peach-leaves and Hair-cap moss, which will occasion diuresis, and thus aid in lessening the severity of the attack. Or an infusion of peach-leaves and

Marsh-mallow root — or, of Horsemint, (*monarda punctata,*) and Mayweed, (*anthemis cotula,*) each equal parts. Either of these may be drank freely, especially in the early part of the attack. A free action of the kidneys is always desirable in this malady, and should be kept up as much as possible. An infusion of equal parts of Cleavers, Maidenhair, and Elder-flowers will frequently prove highly beneficial. In the latter part of the disease, when the tongue becomes coated dark, brown, or yellow, acidulous draughts are indicated, as lemonade, tamarind-water, orange-juice, vinegar, and even tart cider, when there is prostration. If the patient during the early days of the fever desires ice, or iced water, they should not be withheld.

When the pain is very severe, and the inflammatory action intense, in addition to the above-named measures, counter-irritation will often be very useful; mustard may be applied along the whole course of the spinal column, and to the legs, and inside of the thighs. Some practitioners recommend the application of cups over the lumbo-sacral region, and even leeches over the abdomen; there may be cases in which some transient benefit will be derived from these, but I have never yet had occasion to employ them—still, I should not hesitate to do so, were it necessary. But general venesection, which is so almost universally advised by writers, who place their greatest reliance upon it, I am decidedly opposed to, and am induced, from the results of observation, to believe that, at least as frequently as the disease itself, it occasions fatal results. For a full explanation of inflammation, and the influences of general bleedings, I refer the student to Prof. I. G. Jones' excellent work, entitled "The American Practice of Medicine," vol. I, pages 248 to 321.

After the more severe symptoms have been subdued, many practitioners discontinue the exhibition of the former internal measures, substituting for them the compound powder of Ipecacuanha and Opium, to be given in appropriate doses, and at intervals of two or three hours. Others prefer the compound powder of Quinia. These may be used with advantage, the latter especially where typhoid symptoms are present.

I would observe that, in many instances, I have found the tincture of Gelseminum, either alone, or in combination with the tincture of Aconite, sufficient to resolve the disease, without the aid of the compound tincture of Virginia Snakeroot; though when the attack is very severe, I have always found it more advantageous to cause free diaphoresis.

The vagina should be frequently cleansed by injections of tepid water, or, an infusion of Golden Seal and Wild Indigo root; or, of

Golden Seal and Lobelia. Sometimes, an advantage will be gained by carrying the injection within the uterine cavity: but much care will be required in doing this, not to pass the fluid too forcibly within it, nor in too large a quantity at a time; say from two to four fluidounces at a time, and repeated at intervals of four or five hours. Sometimes, benefit will follow injections of warm water into the uterus; from half a pint to a pint may be used at a time, and may be repeated every three, four, or five hours. These injections should always be given by the medical attendant—never by the nurse; they cleanse the organ from all abnormal and putrefied matters, lessen the sufferings of the patient, and aid materially in restoring the parts to a healthy condition.

In addition to the external application of Oil of Turpentine for the tympanitic condition of the abdomen, it will frequently become necessary to administer internal means; a mixture of equal parts of Castor Oil and Oil of Turpentine, may be given in fluidounce doses, and repeated every two or three hours, until catharsis is induced. And when this is employed, other cathartics must be omitted. Sometimes, Paregoric elixir may be advantageously added to the dose. Or, a combination of equal parts of Oil of Turpentine and Paregoric elixir, may be given in small and repeated doses, while other cathartics are being employed instead of Castor Oil. I have met with decided benefit from the use of a saturated tincture of Prickly-Ash berries, as an injection. and administered internally. As an injection, it may be employed in half fluidounce, or fluidounce doses, very slightly diluted with water, and repeated every half hour or hour. When there is much pain, half a fluidrachm of Laudanum may be added to each injection. In some instances, I have beneficially combined it with Oil of Turpentine, with the compound tincture of Lobelia and Capsicum, and with these last-named two preparations together. Internally, it may be given alone, in fluidrachm doses, or, combined with Oil of Turpentine and Paregoric elixir, equal parts of each, of which from half a fluidrachm to a fluidrachm, in some sweetened water, may be repeated every hour or two. The tincture of Prickly-Ash bark will not exert the same influence upon tympanitis, as that of the berries, which appears to have almost a specific influence, and may be used *per rectum* at any period of the disease when tympanitis is present. Its use internally, or by mouth, must not be commenced until the higher inflammatory action has become somewhat lessened.

Vomiting is frequently very obstinate, resisting all measures for a length of time. Generally, the Gelseminum alone, or combined with some opiate, will check it. Or, some aromatics may be used, as

Peppermint-water, Anise-water, Spearmint-water, etc., with Laudanum. Frequently, a Mustard poultice to the epigastric region will be of service in lessening the vomiting. Sometimes, effervescent acidulous draughts will be useful, as Soda or Seidlitz water, with Lemonjuice, and a few drops of Laudanum. And when these do not cause it to yield, it will diminish with the abatement of the inflammation.

In the TYPHOID FORM of puerperal fever, the course of management for the first day or two, during the more active stage of the disease, may be the same as in the preceding form, but afterward, it will require considerable change; and the means, which I am about to advise for the purpose of combating the typhoid symptoms, may also be employed when symptoms of a similar character are present in the depressing stage following the inflammatory.

As soon as it becomes evident that the disease is assuming the typhoid form, the more active and depletory measures must be dispensed with. Instead of creating active diaphoresis, the surface must be kept slightly moist, and sulphate of Quinia, in doses of from three to five grains, with an equal quantity of the compound powder of Ipecacuanha and Opium, may be given for a dose, and repeated every two, three, or four hours, as may be required. Or, the compound powder of Quinia may be substituted for it. The surface should be occasionally bathed with an alkaline bath, rendered somewhat stimulating by the addition of spirits or alcohol. For the purpose of keeping the bowels free, and procuring one, but not over two, moderate alvine discharges, daily, Podophyllin and Leptandrin, in sufficient quantity to produce this effect, may be added to each dose of the above Quinia powders. But, as a general rule, I prefer the crude root of the Leptandra Virginica, itself, as being much more efficacious and beneficial, than either the Podophyllin or the Leptandrin. A tablespoonful of a strong infusion of the root, may be given every hour or two through the day, or sufficiently often to bring about the desired result. And this should be continued throughout the whole course of the disease.

The pain and tympanitic condition of the abdomen must be treated as already described.

As soon as the patient desires acidulous draughts, permit them to be taken, not forgetting that when the tongue is furred dark or yellow, good tart cider is not only refreshing, but is powerfully sanative in its effects.

When the prostration is excessive, sherry, or sparkling Catawba wine, porter, good French brandy, etc., may be given to support the system until reaction comes on: if there are putrid symptoms present, equal parts of yeast and sweet oil may be given in tablespoonful doses, and repeated every hour; or diluted pyroligneous acid may be exhibited; or an infusion of two parts of Leptandra root and one of wild Indigo root may be administered in tablespoonful doses every hour or two. And I would here refer the student to the treatment for putrescency, and other symptoms accompanying absorption of the decomposed placenta, on page 475, and which, to a great extent, will be applicable in this form of puerperal fever.

An equilibrium of the temperature of the surface must be maintained by cooling lotions to the head, and warmth and stimulants to the extremities. In some cases, where the prostration was excessive, I have applied cold to the head, with sinapisms around the legs from the hips down to the feet, and around these placed heated rocks, or bottles of heated water, and with marked advantage. It may frequently become necessary to cut the hair close, when there is much disturbance of the brain, before applying the cooling lotions.

When diarrhea is present, I know of no better agent than the tincture of Chloride of Iron, either with or without some preparation of Opium. It may be given in doses of ten or twenty drops, repeated every hour, in a sufficient quantity of water, and at the same time an injection, after each diarrheal evacuation, should be given, composed of Tannic Acid ten grains, compound tincture of Virginia Snakeroot one fluidrachm, Water one fluidounce, mix. This should be retained by the patient as long as possible. The tincture of Chloride of Iron has a powerful and beneficial influence on the capillary vessels, and it will not only be found valuable in the diarrhea attending this malady, but also in those cases complicated with erysipelas. Whenever I have good reasons for knowing that erysipelas is connected with the puerperal fever, as soon as the more active symptoms have been somewhat diminished, I administer fifteen or twenty drops of this tincture in a proper amount of water, repeating it every hour, until the symptoms have yielded, *and in no instance* has its exhibition been otherwise than beneficial. In many instances I have, from the commencement of the attack, administered the tincture of Aconite, and the tincture of Chloride of Iron, alternately, every half hour or hour, and with the most happy results. But should I meet with a patient in whom it increased the symptoms, of course, I should cease or suspend its use. May not the erysipelatous and typhoid characters of this affection frequently be owing to absorption of putrid matter, as decomposition of coagula within the uterine cavity, or of remaining pieces of placenta or membranes?

In the early stage of puerperal fever the diet must be light and cooling, but more nourishing in the latter stages, as gruel, panada, toast, bread-water, rice-water, barley-water, apple-sauce, prune-water, tamarind-water, etc. And after the danger has passed, the patient remaining much debilitated, chicken-broth, beef-tea, veal-tea, etc., with or without sherry wine, as the case may require, may be allowed, increasing the nutritious character of the diet gradually, as she continues to improve.

It would be impossible to lay down specific rules for the guidance of the practitioner in treating the various forms under which puerperal fever may individually appear. The above general principles of treatment will be found the most successful, although it may require to be modified, or pursued more or less energetically, according to the phenomena which are present. Other means have been advised, some of which are undoubtedly valuable, yet I have considered it the better course to name only those principles of treatment, in this malady, which I have found successful in my own experience. And in closing upon this subject, I would remind the student that not only must he carefully and attentively watch his patients who labor under childbed fever, but he must also use every means to avoid propagating the disease, the same as if its contagious nature were satisfactorily demonstrated.

Frequently, the disease may be prevented by an early attention to the bowels and kidneys—evacuating them by the proper agents, maintaining a determination to the surface by some diaphoretic powder, applying a fomentation to the abdomen when the pains are of a suspicious character, and avoiding exposures to cold, and damp or moist atmosphere.

Dr. J. F. Henderson, of Indiana, informs me that he has successfully treated cases of puerperal fever by the following method: after having evacuated the bowels, and even previous to the action of the cathartic, he administered a mixture of half a fluidounce of Copaiba, with ten or fifteen drops of oil of Turpentine, repeating the dose every four hours. A cloth wet with cold water was kept to the head, and the patient was permitted to drink freely of a strong infusion of Tansy. Cloths were applied to the abdomen, wet with a strong and warm infusion of Hops and Tansy, changing them frequently. As soon as the bowels were evacuated, a powder composed of Sulphate of Quinia five grains, and compound powder of Ipecacuanha and Opium six to ten grains, was given, and this dose was repeated every four hours, until five or six powders had been administered. The Copaiba and Turpentine was continued, together with the fomentations, until all pain and tenderness had been removed, and free perspiration induced, which was generally on the second or third day, seldom longer. In every case the lochia was re-established in two, three, or four days. The bowels were kept regular by the daily use of Leptandrin.

The most prominent symptoms attending his cases, were—fullness and pain in the head and eyes; more or less chilliness, and with some severe rigors, pain in the hips, muscles, and joints, at first slight but soon becoming severe; quick, tense, and full pulse; pain and tenderness over the uterine region, the whole abdomen being morbidly sensitive; scanty and high-colored urine; suspension of the lochia; more or less intense heat of the surface; and, as the disease progressed, all these symptoms became aggravated: the conjunctiva and edges of the lids became red and congested; in some cases the globe of the eye seemed to be literally swimming in water; and the countenance exhibited a peculiar, earnest, pleading, and indescribable expression, that when once seen, it could not be forgotten nor mistaken for any other condition. In most of the patients there were slight remissions in the morning, and in some an entire intermission, but of short duration. Generally, on the second day the tongue was dry and coated white, and, with some patients, slight delirium came on at this time. Obstinate constipation was present in all.

CHAPTER XLVIII.

PHLEGMASIA DOLENS—CRURAL PHLEBITIS—TREATMENT OF PHLEGMASIA DOLENS.

PHLEGMASIA DOLENS, is the name applied to a swelling of one or both legs which occurs soon after delivery, and is accompanied with pain and tenderness. The disease has been termed *milk-leg*, from a mistaken idea that it was owing to a metastasis of milk from the breasts to the legs. It has also received several other names, according to the views of writers, thus, *œdema dolens*, *œdema lacteum*, *phlegmasia alba dolens puerperarum*, *metastasis lactis*, *depôt du lait*, and *crural phlebitis*. It may attack primiparæ but is more frequently met with among multiparæ.

Although this disease has been known to the profession for a long time, yet its nature has not been satisfactorily understood, and, even at this time, there are conflicting opinions regarding it. Mr. White of Manchester, in 1784, considered it to be caused by an obstruction, or some morbid condition of the lymphatic vessels and glands of the parts attacked. Mr. Trye, in 1792, supposed it to depend upon a rupture of the lymphatics, as they cross the pelvic brim. Dr. Ferrier attributed it to inflammation of the absorbents. Dr. Hull, in 1800, considered it to be an inflammatory disease, producing a sudden effusion of serum and lymph. In 1817, Dr. Davis made an autopsy, and found evidences of extensive inflammation of the veins. In 1823, M. Bouillaud, supposed it to be owing to obstruction of the crural veins, having found these veins obliterated in several females who had labored under the disease. In 1829, Dr. Robert Lee succeeded in tracing the inflammation into the uterine branches of the hypogastric veins, and he gave it the name of *Crural Phlebitis.*

The most commonly received opinion, at present, and which is based upon post-mortem appearances, is, that the immediate cause of phlegmasia dolens, is inflammation with more or less obstruction of the crural veins, the inflammation, in many instances, extending from the uterine veins, being seated principally in the cellular and middle tunics of the veins.

Dr. Mackenzie, from the results of a series of experiments, is of the opinion that phlegmasia dolens is owing to a vitiated condition of the blood, and that the venous inflammation is rather an effect of the original disease. He states that all the phenomena of the affection will not be produced by inflammation of the iliac or femoral veins only; that, during health, a mere local cause, as inflammation, or an injury, does not produce the extensive venous obstruction which is found in phlegmasia dolens; that, independently of inflammation or local injury, an obstruction of the veins may be produced by an irritation of their lining membrane, and will be more or less extensive according to the degree of irritation; and, that we are rather to look upon a morbid condition of the blood as the source of this irritation, instead of local injury, inflammation, or disease of the veins.

These views of Dr. Mackenzie appear to be confirmed by the fact, that, phlegmasia dolens has been known to exist when the uterus was in a normal state, and also, when the vessels of the thigh manifested no indications of disease, this being confined to the leg only; again, females suffering under carcinomatous, rheumatic, gouty, and other diseases, seem to be more liable to the puerperal swelled leg than others. Yet, it has occurred among those who were apparently free from any disease up to the time of the attack. Further investigations will be required before a correct and satisfactory theory of the malady can be determined. My own view is, that the disease is primarily an affection of the lymphatics, and that the venous inflammation is merely a secondary result of the original malady. Perhaps, there may exist a previous vitiated condition of the blood, rendering the female more readily susceptible to an attack, and some cases have occurred under my notice which would favor such an idea, yet, at present, I am not prepared to make any positive statements relative thereto. My colleague, Prof. C. H. Cleaveland, entertains similar opinions with my own concerning the real nature of the disease; in a communication to me he observes: "From careful and oft-repeated observations as to the nature and seat of phlegmasia dolens I have become confirmed in the opinion, that it is primarily and essentially a disease of the lymphatic glands, and subsequently of the lymphatic vessels of the leg, the inflammation of which extends to the veins, and to the whole limb.

"This derangement of the lymphatic glands, I believe to be caused by the pressure of the head of the fetus in passing through the superior strait, and the reason why the *left* leg is more frequently the seat of the disease than the right, is owing to the fact that the occiput of the child is more generally directed to the *left side* of the pelvis. At the lower part of the superior, and the upper part of the inferior strait, there are many lymphatic glands which are large enough to be much more prominent than the nerves or veins; and they *must* oftentimes become compressed by the occiput of the child during its passage. This pressure may cause the glands to become inflamed and engorged, and the engorgement will cause an obliteration of their vessels, or, at least, an obstruction to the free flow of lymph through them, which obstruction will lead to congestion and inflammation of the inguinal glands, and gradually of the lymphatics of the entire lower extremity.

"Among the phenomena on which I base this opinion, are, briefly, the following:

"1 The limb does not become seriously implicated for some little time after confinement.

"2. The lymphatic glands of the groin, and the lymphatic vessels of the limb are involved for some time before the nerves or veins appear to be affected; as evidenced by the locality and character of the swelling in every case examined; and also by the exudation of lymph whenever scarification has been employed.

"3. The general lymphatic engorgement of the whole limb, and the *cold*, *white* appearance of the part, contra-indicate inflammation of the veins, or any other tissue except the lymphatics.

"4. The invasion of exactly the same form of disease in the arm of one man after amputation, where the lymphatic glands of the axilla had become involved, and the lymphatic vessels of the whole arm had become engorged; and, also, the appearance of two other cases of phlegmasia in the legs of men where *certainly* the lymphatics were first involved. Writers have also observed the same phenomena among males.

5. The veins can not, in my opinion, be the primary seat of the disease, for they do not appear to be affected until after the disease has existed some days, and, in a few instances, even for weeks, after the affection of the lymphatics.

6. The veins, when inflamed, do not present the same phenomena in any other part of the system as are observed in phlegmasia dolens, as, effusion of lymph, a white, shining surface, and a low grade of temperature.

7. The treatment which is found the most successful in cutting short the disease in its earlier stages, is not such as would be demanded if the veins or nerves were primarily affected, but, *is such* as would be used for inflammation of the lymphatic glands, and vessels elsewhere."

Phlegmasia dolens, although more commonly met with among puerperal females, is by no means confined to them; it has been observed among those whose menstrual discharge has been suddenly suspended; or who have had diseases of the uterine organs, as malignant ulceration of the cervix, polypus, etc. Nor do males appear to be exempt from it, for it has been known to occur in them, following dysentery, diarrhea with ulcerated intestines, cancer of the rectum, external injuries, amputation of a limb, etc. A similar affection has likewise been observed to attack the arms in both males and females, after some injury of the upper part of the body, or, during some carcinomatous disease of the breast.

Various exciting causes have been named, the most common among which is cold; it is said also to be excited by pressure upon the pelvic veins and nerves, uterine disease, suppurative inflammation of the pubes, injuries, inflammation of the sciatic and obturator nerves, and sometimes to occur as a sequel of fever.

SYMPTOMS.—This disease most commonly appears between the tenth and fifteenth day after delivery; though it has been met with as early as on the fourth day, and again at a later period, even after the third week. It is generally preceded by pains or uneasiness in the lower part of the abdomen, with symptoms of uterine or venous inflammation, and a feeble, depressed, or irritable condition of the patient; frequently the patient is suddenly attacked without any premonitory symptoms.

It usually manifests itself with severe rigors, followed by an increased temperature of the surface, and by a sudden and deep-seated pain in the groin, or thigh. After a few hours the affected limb commences swelling, and usually upon its inner and anterior surface. In the greater number of cases, this swelling is first observed in the calf, from whence it travels rapidly upward; occasionally, it extends from the thigh downward. Not unfrequently, before any pain in the thigh or groin is experienced, the calf of the leg will be found swollen, painful, and hard, as if it were attached to the bone, and can not be shaken, while the calf of the other limb, on being shaken, will be found flabby and movable. It is not unusual for the buttock, and labium pudendi of the diseased side, to share in the abnormal action.

The swelling is hard and elastic, the skin is tense, shining, white, and exceedingly sensitive to the touch, with an augmented temperature, and although yielding to pressure, does not leave a pit, except upon the parts which are free from pain, or at the decline of the disease. In the direction of the femoral vein, a hard, exceedingly painful cord may be felt, which is the thickened and indurated vein; sometimes, an enlargement of the inguinal glands may be detected. If the limb be punctured, only a few drops of a gelatinous fluid will be discharged. As the swelling progresses, there is, generally, some abatement of the pain, but not an entire removal.

The pain accompanying the swelling is very severe, and is much aggravated by any motion of the limb, or even by the slightest pressure. It is usually more intense on the inside and back of the thigh, in the direction of the internal, cutaneous, and crural nerve. Sometimes it commences in the back and hip-joint. It is constant, though there may occasionally be slight remissions; and the best position in which the limb can be placed is to have it slightly elevated upon an inclined plane, having an angle of from 6° to 10°; or, it may be flexed both at the knee and hip joints. In a depressed or depending position, the pain will be much augmented. From the commencement of the attack, the affected limb feels heavy and stiff, and, as the disease progresses, the patient will be unable to move it, not only from the excessive pain produced, but, because the limb has become powerless.

In connection with the pain and swelling, there will be more or less fever, headache, nausea, or vomiting, quick and feeble pulse, giving frequently 130 to 140 beats in a minute; thirst, restlessness, and sleeplessness. The bowels are usually constipated; the urine turbid, and small in quantity; the lochia are suppressed, or fetid, sometimes the discharge remains unaltered; together with other symptoms, varying in degree, but indicative of the general disturbance to the constitution. These disappear gradually as the pain diminishes, leaving the patient extremely debilitated. Sometimes, there will be a copious perspiration throughout the whole course of the disease, which will debilitate the patient very much.

It is very seldom that phlegmasia dolens attacks both limbs at once; though it may happen, that when the pain and swelling of the limb first attacked subsides, the disease will manifest itself in the other one. It usually lasts from four to six or seven weeks, though the acute stage may continue for only ten or fifteen days. It may *terminate* in resolution, the swelling disappearing, and perfect use of the limb being restored; or, the swelling may take place slowly, the female not wholly recovering the use of the affected limbs. Suppuration, with ulceration, occasionally occurs, the consequent exhaustion eventually destroying the woman. And sometimes, death occurs either suddenly, as for instance, when the patient raises herself in the bed, or it may take place gradually from the secondary affections induced. Most generally, the acute symptoms are followed by a chronic form, in which the limb never returns to its original size, and remains almost powerless through life.

DIAGNOSIS.—This affection may be known, by its occurring within a few days or weeks after delivery; by the pain down the affected limb; by the hardness of the swelling; the attending fever; and the hard, cord-like, and painful condition of the femoral vein. If the calf of the leg is firm, hard, immovable, and painful on being compressed, and, if pain is produced in the upper part of the limb on rotating it, these are positive indications of crural phlebitis. The left side is more commonly attacked with the disease than the right.

PROGNOSIS.—The disease seldom proves fatal. The less severe the fever and the swelling, the milder will be the attack. When a favorable change is about to occur, the pain gradually diminishes, leaving a numbness of the leg for some time; the swelling softens and becomes œdematous, pitting upon pressure.

POST-MORTEM APPEARANCES.—The cellular membrane of the limb will be found distended with effused serum. The affected vein will be obliterated by adhering clots of blood, or coagulable lymph; its parietes thickened; its inner tunic of a deep red color; and pus may be contained within its canal. Pus may likewise be found, together with evidences of inflammatory action, in the absorbents; small abscesses may be observed in the substance of the affected leg; and frequently, traces of secondary affections in the joints, cavities, etc., may be present.

The veins most commonly attacked, are the femoral, iliac, epigastric, spermatic, uterine, and vaginal, the saphena, and the vena cava.

TREATMENT.—During the acute stage, the indication is to allay inflammatory action; and in the second or chronic stage, to promote absorption of effused fluid and restore the venous circulation.

To fulfill the first indication, both general and local measures will be required. Among the general measures, the first which demands our attention, provided there is no diarrhea, is the administration of a brisk cathartic, as, for instance, the compound powder of Jalap, with some nitrate, or bi-tartrate of Potassa added; or, a combination of Podophyllin, Leptandrin, and one of the above salts of Potassa. The purgative should be administered in a dose sufficient to act thoroughly, without a repetition of it within four or five hours. It not only empties the intestinal tract, removing any existing morbid accumulations, but it likewise has a revulsive effect, and renders the system more susceptible to the beneficial influences of subsequent medication. If necessary, the cathartic may be repeated again on the second or third day; and, during the whole period of the acute stage, the bowels must be kept free, causing one evacuation daily. The means heretofore named for this purpose may be employed; but I prefer an infusion of two parts of Leptandra root, and one part of the root of Blue Flag, (*Iris versicolor,*) which may be given every hour or two in doses of a tablespoonful, or sufficiently often to produce the desired result.

After the cartharsis, agents must be administered for the purpose of allaying the inflammation and lessening the pain. Equal parts of the saturated tinctures of Colchicum seed, and Black Cohosh root, (*Cimicifuga rac.*) may be combined, and given in half fluidrachm or fluidrachm doses, and which may be repeated every two, three, or four hours, according to the degree of inflammatory action, and the influence of the remedy. Sometimes, and more especially when the pain is intense with high inflammation, from three to eight or ten drops of the tincture of Aconite root, may be added to each dose of the above compound, or, to every other dose, according to the influence it exerts upon the system. The above agent will most generally be found to act promptly in subduing the more active symptoms.

Other agents, of equal value, may be used to fulfill the same indication; thus, the tincture of Gelseminum, administered either alone, or in conjunction with the tincture of Aconite, will be found to exert a prompt and beneficial influence. Norwood's tincture of Veratrum Viride, has been used by many practitioners, and with excellent results, both in this affection, puerperal fever, and many other febrile and inflammatory conditions. In one point this tincture resembles that of Gelseminum; thus, its action appears to depend upon a volatile principle, for, if prepared from the dried root, or left exposed to the atmosphere, its effects are not so beneficial nor so prompt as
pared from the fresh root, and kept in well stopped b

Occasionally, when there is no mitigation of the pain by the above means, the sulphate, or acetate of Morphia may be prescribed in doses of one-fourth, or, one-half a grain, and repeated as may be required; this may be given more particularly when the patient is restless, irritable and sleepless.

Diuretics are an important part of the treatment, and those of a non-stimulating character only should be allowed. A cold infusion of Cleavers, (*Galium aparine*) may be used; or, an infusion of equal parts of Cleavers, Maidenhair, (*Adiantum pedatum*), and Elder Blows, (*Sambucus Canadensis*), may be prescribed, and, in all cases, these diuretics should be used freely. Hair-cap moss, (*Polytrichum juniperum*), will likewise be found very beneficial as a diuretic; an infusion may be administered of this plant only, or in combination with some of the preceding diuretics. And when the patient becomes averse to one diuretic infusion, another should be substituted.

Gastralgia, or a burning pain in the epigastric region, is sometimes present, and may be relieved by the administration of a powder composed of nitrate of Bismuth ten grains, Lupulin two or four grains, and this may be repeated every four or five hours. An infusion of Peach-leaves will also relieve it, as well as the tinctures of Gelseminum and Aconite.

Among the local measures, fomentations to the affected limb occupy a prominent position. Vinegar in which hops have been boiled, or, an infusion of Water Pepper, (*Polygonum punctatum*), may be applied to the whole limb by means of flannel cloths. Sometimes a warm application will be found the most advantageous, at others a cold one; this point must be determined, by the practitioner, according to the peculiarities of each individual case. Generally, cold applications will be preferable, but when they occasion a sense of cold or chilliness, they are contra-indicated, and the warm applications must be substituted. Sometimes a bandage may be *loosely* applied along the whole limb from the toes to the groins, which should be kept constantly moistened with cold or warm water, or with a mixture of water and spirits, and frequently, a solution of muriate of Ammonia will be found most valuable; be careful not to bandage tightly in the acute stage.

In the early part of the attack, much advantage may be derived from the application of cups or leeches on the limb, along the course of the pain, and many of our practitioners have beneficially employed these. I have always, heretofore, succeeded without them, but should not hesitate a moment to use them in any case where I considered it necessary.

But, of all the applications to the limb during the intensity of the attack, I know of none superior or equal to recent Stramonium leaves when these can be obtained. They should be bruised, and the whole limb covered with them. It is considerable trouble to collect and prepare the remedy in this manner, but a similar benefit, though in a minor degree, may be obtained by bruising the leaves, placing them in hot, not boiling water, and applying this infusion, either warm or cold, by means of flannel cloths. The application may be extended across the hypogastric region with advantage. Dried Stramonium leaves do not exert the same prompt and decided influence over the inflammation, but their action may be improved by combining them with an equal quantity of Lobelia, and applying as above.

Blisters applied more especially to the groin of the affected limb, or along the course of the pain, have been used with favorable results by many practitioners, though I have never found it necessary to employ them in my own practice. I have, however, frequently and beneficially applied a sinapism across the sacral and lumbo-sacral regions, and I prefer this to a blister on these points, on account of the decubitis being principally and for some time upon the back, or nearly so.

The patient should be kept as quiet as possible during the inflammatory stage, the apartment should be kept at a moderate temperature, and she must be restricted to a low and cooling diet. After the removal of this stage, a more nourishing diet may be allowed, and should there be much debility, tonics, or wine may be judiciously administered.

After the inflammatory symptoms have been subdued, measures must be taken to promote absorption and restore venous circulation. Internally, the mixture of the saturated tinctures of Cimicifuga and Colchicum seed may be continued, together with the diuretics. In the advanced chronic stage alteratives must also be used, as some preparation of Iodine, the compound syrup of Stillingia and Iodide of Potassium, or, the compound syrup of Yellow Dock may be substituted. Muriate of Ammonia may be beneficially employed at this period of the disease, five or ten grains in solution, or syrup, may be administered every two or three hours. Or, it may be added to the above syrups instead of the Iodide of Potassium.

The limb should be carefully bandaged from the toes to the thigh, but not so tightly as to render the patient uncomfortable. As the bandage will require to be removed and re-applied twice in the course of every twenty-four hours, these periods may be improved for the purpose of applying friction, as well as some stimulating liniment or wash, to the limb; and the bandage may even be kept moist with the same stimulant, or with a solution of muriate of Ammonia. Currents of galvanism or electro-magnetism may likewise be passed through the limb once or twice daily, more especially in the advanced chronic stage. Of course, as in the acute stage, the limb should be kept in an elevated position, for such a length of time as may be deemed proper, in order to render the cure thorough and permanent. An irritating plaster over the sacrum, or, over the lumbo-sacral region, ought never to be omitted in the second stage — it tends greatly to facilitate the cure. The sore produced by it should be kept discharging as long as the patient can bear it. And after it has healed, if its further employment be indicated, do not hesitate to apply it. I know it is exceedingly painful and annoying, but its advantages, in this disease, repay its disadvantages a hundred times over.

Whenever the lochial discharge is fetid, whether in the first or second stage of the disease, tepid water, an infusion of Marsh-mallow root, or, diluted pyroligneous acid may be injected into the vagina, two or three times a day.

Any ulcers of the leg, caused by the disease, which may present themselves, are to be treated upon the same principles as other ulcers.

In the second stage, the patient should be allowed to sit up more or less during the day, but never with the limb in a depending position; the diet should be nourishing and of easy digestion, and tonics, wine in moderate quantity, or wine and Peruvian bark must be allowed when there is much debility. In the more advanced stages of the disease, sea-bathing has been recommended, and may, probably, be occasionally useful.

The above treatment will, in the majority of instances, effect a perfect cure, if it be commenced sufficiently early, but the practitioner must not be disappointed in occasionally finding patients who, notwithstanding the active and energetic means employed, recover only to carry for the remainder of their existence, a debilitated and enlarged limb.

CHAPTER XLIX.

PHRENITIS—PUERPERAL MANIA—TREATMENT OF PUERPERAL MANIA—INTESTINAL IRRITATION—ACUTE TYMPANITIS—DIARRHEA.

INFLAMMATION of the brain and its membranes, is sometimes met with in puerperal females; there will be headache, flushing of the face, throbbing of the arteries, intolerance of light and sound, delirium, and all the symptoms of an ordinary phrenitis. The treatment will not vary from that usually pursued when the inflammation occurs at other periods.

It may be proper to observe here, that for five or six weeks after delivery, females are subject to severe cerebral derangement, from eating oysters, clams, and indigestible articles of diet, or from partaking too freely at meals. The most common symptoms in such cases are, headache, delirium, insensibility, convulsions, and death. They must be actively treated by the usual means for such disturbance, but it will frequently be found that treatment produces no amelioration of the symptoms, the disease steadily advancing toward a fatal termination.

PUERPERAL MANIA, is more frequently met with than puerperal phrenitis, and is said to occur more frequently among unmarried females than others. Those of an excitable or very sensitive disposition are the most liable to it, though no constitution or temperament is exempt. It may occur during gestation, during parturition, or subsequently: the most usual periods of attack are a few hours or days after labor, before the system has fully recovered from the shock; and, at some period previous to weaning, when the constitution is suffering from the debilitating influence of lactation. It may continue for a few days, or months, and frequently many years may intervene between the commencement of the attack and the mental restoration; occasionally the mania continues through life.

There is a species of delirium which is occasionally observed when the head of the child is passing through the os uteri, or when it is distending the perineum, and which is probably caused by the excessive pain experienced at these times. It is not permanent in its character, generally disappearing shortly after the passage of the child through the parts. The female is frequently aware of the wildness and absurdities of her thoughts and expressions during this period.

Puerperal insanity is frequently hereditary, all the females of a fam- generation to generation, being subject to more or less mental derangement at the parturient period; and when this is known to be the case with a pregnant female, the practitioner should endeavor to ward off an attack by proper treatment during the gestating months. A common predisposing cause is the extreme susceptibility or excitability of the nervous system and brain to which pregnant females, as well as those who give suck, are subject, and which renders them exceedingly liable to morbid impressions.

Mental emotions, as a great anxiety relative to her condition, or a state of depression, or a severe fright occurring during pregnancy, may likewise predispose the female to an attack of mania; and a very common predisposing cause is derangement of the digestive functions. Profuse hemorrhage has also been considered a predisposing cause.

The exciting causes are many; as irritation of the breasts, uterine irritation, suppression of lochia, the vascular disturbance caused by labor, suckling, nervous shock of labor, cold, and frequently it occurs without any assignable cause.

SYMPTOMS.—These do not vary essentially from those which occur during the insanity of non-pregnant females, or of males. The attack may come on suddenly, or it may take place gradually, and is frequently preceded by more or less headache, nervous irritability, and sometimes derangements of the digestive organs. Sometimes the female will be restless and sleepless, incessantly talking, and expressing herself in a wild, disconnected, and most absurd manner; at other times she will be depressed and melancholy. Females have been known to escape the watchfulness of their attendants when attacked by puerperal mania, and roam for a great distance from home, even through snow and severe cold weather, and without any other result than a restoration to sanity; which, however, would probably have occurred independent of such exposure and exercise.

It would occupy more space than would be necessary in the present work, to detail the various symptoms which may occur in this disease: suffice it to say, that though there may be some peculiarities attending it, yet the general symptoms present the same features as those of the several varieties of insanity met with at other times.

There are two opposite conditions of the vascular system in this disease; one is accompanied with more or less fever, a quick pulse ranging from 120 to 140 beats in a minute, headache, throbbing of the carotids, flushed face, intolerance of light, great mental excitement with incessant raving, it being almost impossible to restrain the patient. The tongue is usually coated with a slimy fur; the urine is turbid and scanty; the secretion of milk diminished, as well as its nutritive qualities; the bowels constipated; the lochia suppressed, or natural; and often a peculiar and offensive odor emanates from the various excretions. If a disposition to commit violence is present, it is commonly directed against others, and not against herself.

In the other condition, the pulse is feeble and but slightly accelerated; the temperature of the surface is natural or diminished; there is but little or no headache; the tongue is coated white; the bowels are constipated; the countenance is pale and sunken, but sometimes calm and tranquil, with a gradually progressing emaciation. In this condition the patient is usually in a depressed or melancholy state, and is frequently aware of her situation: there is more or less mental apprehension, perhaps a religious mania, with great physical inactivity, and a strong tendency to commit suicide.

Puerperal mania may terminate in a few hours, the mind being perfectly restored; or it may continue for months or years, with ultimate recovery; or it may, as has been observed in a few cases, be permanent and incurable; or it may terminate in death, especially in the raving variety, which is attended with quick pulse and febrile symptoms.

DIAGNOSIS.—Puerperal mania may be confounded with phrenitis; but although the pulse be quick in mania, it is not so sharp and hard as in cerebral inflammations, nor is there such a high degree of the heat of the surface and of the febrile symptoms: in phrenitis there is an intolerance of light and sound, which is seldom the case in mania: phrenitis is attended with fever, headache, and other inflammatory symptoms, for some time before delirium manifests itself, while in mania the incoherency exists from the commencement.

It may be determined from congestive headache, by observing that this does not commence with delirium: and from delirium tremens, by learning the history of the case, the previous habits of the patient, and by attending to the attack, which, in delirium tremens, is not sudden, and is attended with a cold, clammy skin, profuse sweats, tremors, and tremulousness of the tongue.

When a pregnant female is subject to "frequent hysterical attacks, unaccountable exuberance or depression of spirits, morbid aptitude to exaggerate every trivial occurrence and attach to it great importance, suspicion, irritability, or febrile excitation; or, what is still more indicative, a soporous state, with very quick pulse, then," says Burrows, "the supervention of delirium on labor must be dreaded." And to these symptoms Ramsbotham adds, as a prominent forewarning, a great loss of memory.

PROGNOSIS.—The more serious form of puerperal mania, is that which is manifested by a greater or less degree of excitement. When it occurs immediately after delivery, with a *constant* and *rapid* pulse, the paroxysms being furious and ungovernable, it is much more dangerous to life than when it occurs later, and with milder symptoms. Free evacuations from the bowels are favorable, as are likewise a decrease of the pulse, the patient obtaining some sleep, and not being much prostrated. A rapid pulse, increasing in frequency, is generally indicative of a fatal result, the mania being probably connected with an inflammatory action of some of the pelvic or abdominal viscera. The melancholy form of puerperal mania is more permanent, and more difficult of removal, than the raving. " Mania is more dangerous to life—melancholia to reason."—(*Gooch.*)

TREATMENT.—We must attend to the symptoms as they manifest themselves, endeavoring to overcome the excitable condition of the brain and nervous system, without occasioning or allowing any great amount of debility to ensue. The bowels must be opened occasionally by some mild, stimulating purgative, and kept free, during the intervals, by gentle laxatives. The compound powder of Jalap will answer as a purgative; or Podophyllin, Leptandrin, and Xanthoxylin may be given. As a laxative, the powder of Rhubarb and Bicarbonate of Potassa may be used, or the compound syrup of Rhubarb and Potassa. If the patient cannot be persuaded to take these, stimulating enema may be used, as Castor Oil, with the compound tincture of Lobelia and Capsicum added.

One or two emetics administered at the commencement of the attack, has frequently produced results of a decidedly beneficial character; but it must be recollected that they are injurious when there is prostration of the system, with a feeble, rapid pulse, pale face, and cold surface.

Counter-irritation will be found of great value. The whole surface should be bathed with a warm alkaline solution to which some alcohol has been added, after which a sinapism may be applied the whole length of the spinal column, together with friction and stimulating applications to the inferior extremities from the hips downward. In connection with this, the application of tepid or cold water to the head three or four times a day as a douche, will prove beneficial; or cold applications may be constantly kept to the head. When there is much activity of the circulation, with preternatural heat of the head, the hair should be cut off, and sometimes leeches or cups to the temples and nape of the neck will be advantageous. The sinapisms may be changed alternately from the spinal column to the extremities, and vice versa, removing them when considerable redness of the surface to which they have been applied is produced. An irritating plaster, as for instance, the compound Tar plaster, may sometimes be advantageously applied to the nape of the neck or between the shoulders; but in order to derive an immediate benefit from it, vesication should first be effected by means of a blister.

After the bowels have been evacuated, sedatives should be exhibited. The tincture of Gelseminum will be found exceedingly valuable; it may be used alone, or in the following combination: Take of tincture of Gelseminum one fluidounce, tincture of Belladonna two fluidrachms, sulphate of Quinia sixteen grains; mix, and administer half a fluidrachm for a dose, repeating it every hour, until the peculiar influence of the Gelseminum is obtained, after which it should be given every three or four hours, or at sufficient intervals to maintain, but not increase, its influence. The tinctures of Stramonium, or Hyoscyamus may be substituted for that of the Belladonna. Other agents may also be employed with benefit, as a powder composed of sulphate of Quinia one grain, sulphate of Morphia half a grain, extract of Belladonna (dried) one-eighth of a grain; mix for a dose, which may be repeated every hour. In some cases, two parts of the compound tincture of Virginia Snakeroot may be added to one part of the tincture of Gelseminum, of which a fluidrachm may be administered every hour until a sedative influence is obtained. Sleep and quiet are the patient's great restoratives: and every justifiable means should be adopted to procure sleep.

The patient should be kept in a darkened room, free from noise or disturbance, and an experienced nurse should be obtained who is accustomed to attend such patients, and who understands how to manage their whims and caprices—for a scolding, contradictory, or inattentive nurse, will effect more injury than benefit, by increasing the excitement and fury of the patient. If the female be very boisterous and unruly, attempting violence, it may become necessary to employ some restraint, as a strait waistcoat, but this must not be used without it is absolutely required; frequently, an observation to the nurse, in the presence of the patient, that this will have to be employed, will at once calm the most raving maniac. She should never be left alone, and the windows of the apartment which she occupies should be well secured, and all knives or other dangerous instruments, with which she might effect suicide, or injure others, must be removed. The diet must be nutritious, and should there be much depression of the system, stimulants will be required. It is frequently the case that the patient will refuse to take either food or medicine. A proper amount of food must be taken within the twenty-four hours, and the medicine may frequently be concealed in it; but when she obstinately refuses food, a cold douche, if not contra-indicated, a reference to the strait waistcoat, or persuasion, may succeed in causing her to eat. Sometimes, if left within her reach, she will eat the food when under an idea, probably, that she is unobserved. It is always proper, when it can be accomplished, after the severity of the first attack has subsided, to have the female exercise as much as possible in the open air, but not to such an extent as to cause fatigue. There is frequently an anæmic condition of the system in this disease, which the practitioner should carefully observe, and for which some ferruginous preparation will be found to act like a charm.

In the early stages of puerperal insanity, it is not prudent to allow the female to see her husband, child, or friends, as it generally proves injurious, by giving rise to ideas, or mental efforts, which increase the cerebral disturbance; but, in the passive or chronic stages, short and distant interviews are frequently followed by an abatement of the mental derangement. And, whenever it is deemed desirable that she should see her child, she must not be permitted to handle it, lest in a sudden maniacal fit she should destroy, or seriously injure it.

When there is reason to anticipate an attack of mania at the parturient period, either from a hereditary predisposition, from insanity at a former labor, or from the symptoms heretofore described, a proper course of treatment should at once be instituted. The bowels, especially, should be kept regular, and no crude, indigestible, or other improper articles of diet should be allowed. All sources of irritation should be removed, the mind must be kept free from exciting or depressing influences; coition during the gestating period must be positively forbidden; moderate exercise must be advised, but not to the extent of fatigue; the female should not be allowed to remain alone, and the company permitted to visit her must be carefully selected, refusing admittance to those who occasion too great a degree of mirth, as well as to those who are fond of dispensing horrible and melancholy news, whether true or false; pleasant, cheerful, and prudent individuals only should be selected. If the patient be sleepless, Scutellarin, Asclepidin, Lupulin, or some similar agent may be used; or, an infusion of the herbs may be drank through the day. Plethora must be overcome by diuretics; anæmia by chalybeates; and debility by bitter tonics and such other invigorating measures as may be found serviceable. The compound syrup of Partridgeberry, will be of advantage in many instances. Should there be a constant, dull, or severe pain in the head, cooling lotions to the head, sinapisms to the back of the neck, with rest and quiet, will, in conjunction with the other means, generally remove it, and prevent the attack at the puerperal season.

Females are subject to a condition slightly resembling peritonitis, and which has been named INTESTINAL IRRITATION, by Dr. Marshal Hall, and *Acute Tympanites*, by Dr. Ramsbotham. It may be owing to some peculiar excitement or irritation of the lining membrane of the intestinal tube, occasioned by a constipated condition of the bowels, improper food, or irregularities of diet, which, by debilitating the muscular fibers of the intestines, causes, soon after delivery, a sudden development of gas.

The attack occurs generally two or three days after delivery, being ushered in with rigors, which are more or less severe, and are succeeded by increased heat and dryness of the skin; rapid pulse, fuller and firmer than in peritonitis, or fluttering and tremulous; tongue red, sometimes furred; countenance changed, but not as anxious as in peritonitis: severe headache; intolerance of light, and sound; constant wakefulness: and often delirium. At an early period the abdomen swells rapidly and to an enormous extent, being very tense and painful, and the pain is aggravated by pressure; frequently the transverse colon can be distinctly traced. The secretion of milk becomes suspended, as well as the lochia; the patient lies upon her back in a state of languor, being averse to conversation, or any kind of disturbance; the legs are usually drawn up, and the female appears indifferent to everything about her. As the disease progresses, the pain, and swelling of the abdomen increase, the tongue becomes dry and brown, with vomiting of offensive matter, hiccough, low, muttering delirium, subsultus tendinum, and other symptoms common to the last stage of fever.

DIAGNOSIS.—The principal distinguishing mark between this disease and peritonitis, is the period of abdominal enlargement. In peritonitis the first symptom is pain, and the swelling does not come on until the disease has existed sometime; in the disease under consideration the swelling manifests itself first, and the pain is subsequent, being, probably, occasioned by the inordinate inflation of the intestines, together with a morbid state of the nerves. In peritonitis the patient is anxious as to the termination of her disease; in the present affection there is a great loss of nervous energy, occasioning a complete state of listlessness.

PROGNOSIS.—A subsidence of the tenseness, swelling, and pain of the abdomen, with the pulse becoming more natural, the tongue clean and more moist, the skin cool and soft, the bowels becoming free with expulsion of large quantities of wind, vomiting ceasing, intellect unimpaired, a desire for food, and an attention to surrounding circumstances are indicative of recovery.

TREATMENT.—Should there be any undigested food upon the stomach an emetic may be administered, to be followed by a purgative conjoined with some carminative. The compound powder of Jalap, may be given in conjunction with some essence of Peppermint, of Nutmeg, tincture of Ginger, or tincture of Prickly-Ash berries. At the same time an injection should be given, prepared as follows: To one quart of a strong decoction of Senna and Boneset, add a pint of molasses, two drachms of pulverized Lobelia seed, and one ounce of tincture of Prickly-Ash berries. This should be used at one injection, and may be repeated in ten or fifteen minutes, if no evacuations are induced.

After the bowels have been freely relieved, the following powder may be given, and repeated three or four times a day: Take of compound powder of Ipecacuanha and Opium five grains, Dioscorein two grains, Ginger two grains; mix for a dose. Or, Podophyllin two grains, Dioscorein eight grains, and Hydrastin four grains, may be mixed together and divided into four powders; one of these is a dose, and which may be repeated three or four times a day. Much benefit will also be derived from the exhibition of a fluidrachm of the tincture of Prickly-Ash berries every two or three hours, in some water, or, in an infusion of Dioscorea Villosa. These agents allay irritation, aid in expelling the gas, and gradually restore the tone of the intestines. Cloths wet with hot water, or hot fomentations of Hops and Tansy, or other bitter herbs, will prove highly valuable when applied over the abdomen.

The oil of Turpentine, exhibited externally and internally, has been highly extolled in this disease. Externally, it is to be applied over the surface of the abdomen; internally, one or two fluidrachms, mixed with the white of an egg, may be given, and the dose repeated every four hours; or, if rejected by the stomach, an ounce of it may be injected into the rectum.

Should any inflammatory symptoms be present, they must be combated by the means already explained.

The patient should be kept quiet, her room being somewhat darkened, and no visitors should be permitted to enter. After the evacuation of the bowels, when the swelling begins to subside, a nutritious, easily-digested diet should be allowed, with some stimuli if required. Tonics may also be exhibited. I know of no better agent to rapidly restore the tone of the intestines, after all the dangerous symptoms have been removed, than a powder composed of Ginger, Dioscorein, and Asclepidin, each two grains; mix for a dose, and repeat every three or four hours through the day. These should be accompanied with an occasional dose of the tincture of Prickly-Ash berries. Or, the compound powder of Golden Seal may be used with benefit, in doses of half a drachm, repeated three times a day.

DIARRHEA, may precede labor, continuing after delivery, or it may occur shortly subsequent to delivery. It frequently proves obstinate and fatal. The bowels should be evacuated by the compound syrup of Rhubarb and Potassa, or, the compound powder of Rhubarb, after which either may be continued in smaller doses. If the diarrhea continues without improvement, after their employment for a day or two, omit them, and substitute a powder composed of Caulophyllin, Geraniin, and Leptandrin, each, one grain; mix for a dose, which may be repeated every hour or two; at the same time the patient should drink freely of some astringent infusion, as of Blackberry root, Beth root, etc. If cramps or spasms are present, the compound powder of Ipecacuanha and Opium, or, the compound powder of Yellow Ladies-slipper, may be given by mouth, or by injection, if the stomach will not retain them. Should these means fail to remove the diarrhea, the tincture of chloride of Iron, will then have to be used according to the method advised on page [illegible] The diet will require to be strictly regulated until the cure is effected.

In diarrhea occurring after delivery, the practitioner should carefully watch for a prolapsus of the uterus; this displacement of the organ will frequently be found present, rendering the diarrhea intractable to all agents, until it has been reduced. On several occasions, the treatment above-named has failed to effect any benefit, until after a reduction of the prolapsus, when a gradual cessation of the diarrhea follows.

CHAPTER L.

INFLAMMATION OF THE BREASTS—MAMMARY ABSCESS—EPHEMERAL FEVER—WEED—MILK FEVER—SORE MOUTH OF NURSING WOMEN.

INFLAMMATION OF THE BREASTS, of nursing women, is of frequent occurrence; it may happen at any period of lactation, but is most commonly met with during the first month after delivery. At first, the inflammation is usually limited to a circumscribed spot, but continues to extend into the surrounding [illegible] til the whole breast becomes involved; occasionally [illegible] be affected [illegible] the beginning, and, sometimes, both breasts become inflamed simultaneously. There is a strong tendency to suppuration in inflammation of the mamma, which is often very difficult to prevent.

This affection may be caused by an increased accumulation of milk within the lactiferous tubes, occasioned by the mother not allowing her child to suck, on account of tender and excoriated nipples, or, perhaps, because she absents herself from her child, frequently and at long periods, in order to enjoy parties and places of amusements, thus neglecting to give to the distended breasts the relief they require. A neglect of this kind, repeated several times, will readily induce an abnormal condition of the glands. The disease may also be produced by cold, and this is undoubtedly a common exciting cause. It may likewise follow mechanical injuries, as blows, compression from tight-lacing, etc., and may be induced by strong mental emotions. All females are subject to it, but those of a strumous diathesis, or who are delicate and feeble, are especially so. It is more common to primiparæ; but, many females suffer from it after each confinement.

SYMPTOMS.—Generally, the first symptoms experienced are more or less severe rigors, followed by fever; a shooting pain in the breast, is complained of by the patient, which is aggravated by pressure, and accompanying which there is a gradual swelling of the organ. Upon examining the breast at an early period, a circumscribed hardness will be observed, within which the pain is located, and the skin over which presents a natural appearance. As the disease progresses the swelling becomes more extensive, the pain more severe, the skin hot and shining, and of a dusky-red color, and finally the swelling becomes soft and slightly œdematous, with more or less marked fluctuation, indicative of the formation of pus. The symptoms now increase in severity; the patient becomes fretful in consequence of the severe pain, distressing shiverings, want of sleep, and nocturnal perspirations, all of which occasion a gradual loss of appetite, strength, and flesh. Sometimes nausea is present, and not unfrequently an obstinate diarrhea.

The pain is more severe in proportion to the extent and depth to which the gland is involved. If the inflammation be superficial, the pus is laudable; if it extend deeply, there is always sloughing of considerable magnitude present. The suppuration ensues more rapidly when the inflammation is superficial, or in the cellular substance under the skin.

This disease is more unfavorable to patients of a strumous habit, and, though it rarely proves fatal, yet it requires prompt and energetic

frequently of tedious and difficult cure, and has been known to arouse a dormant and inactive predisposition to disease, into a fatal activity.

TREATMENT.—The indication for treatment is, to promote resolution; but, if the disease has continued for two or three days, with considerable heat and pain, resolution can seldom be effected, and then, means must be adopted to promote suppuration. Suppuration usually occurs in ten or twelve days, seldom sooner.

In order to prevent the inflammation from terminating in suppuration, the treatment must be commenced by the administration of an active cathartic. The breast should be bathed two or three times a day, with some stimulating preparation; I generally employ a liniment made of equal parts of oil of Cajeput, oil of Sassafras, Olive oil, and Camphor. After applying this, a warm poultice or fomentation may be applied, and which should be changed two or three times a day, at the periods of bathing with the liniment.

Although I have just recommended the application of a fomentation or poultice to the breast, it is only because others have frequently used them with advantage. For the last twenty years I have never employed any other agent for the resolution of the disease, than the following ointment, to be applied immediately after having bathed the breast with the above liniment: Take of Castile Soap six ounces, good Lard four ounces, yellow Beeswax two ounces; finely cut, or shave the soap, add to it the other articles, and melt the whole together by means of a moderate heat. When thoroughly melted and incorporated, remove the vessel containing them from the fire, and when nearly cool, add gradually three fluidounces of Jamaica Spirits, in which three drachms of Camphor have been previously dissolved. Continue stirring the mixture until it is cold.

This ointment has been used with success in every case where it was applied at an early stage, or previous to suppuration; it removes all pain and swelling in from twelve to thirty-six hours, according to the duration of the disease. I have frequently found it efficacious in cases where the patient had suffered severely for twenty four-hours, and when I had every reason to believe that the suppurative stage had actually commenced. I employed it with constant success for nearly fourteen years before having made it known to the profession.

The manner of using it is as follows: Cut a piece of linen in a circular form, of the size of the whole breast, leaving an aperture in the center sufficiently large for the nipple to pass through. Then soften a sufficient quantity of the ointment by a gentle heat, and spread it on the linen. Apply this over the breast, as warm as can be borne; at intervals of four or six hours, remove it, soften it as before, and reapply to the breast immediately after having bathed it with the stimulating liniment. A fresh application of the ointment will be needed only once in every twenty-four hours; the patient should be kept quiet in bed, and the breast should be carefully supported by a bandage, or some similar means.

During the first stage of the disease more especially, it is of great importance to keep the breast as empty as possible, and if this cannot be effected by the infant, other means must be resorted to, as, some older person accustomed to the business, a young pup, or an exhausting pump. And any febrile symptoms may be mitigated, as well as pain and nervous irritability, by the exhibition of the compound powder of Ipecacuanha and Opium, or some similar preparation. When the pain is excessively severe and the febrile symptoms run high, it will be better to avoid feeding the infant at all from the affected breast, and, in some cases, it will be proper not to annoy the mother and increase her sufferings by requiring her to give it suck, but to feed it for a short time in some other way; if possible, have a wet nurse employed.

If, however, matter should form, then the employment of poultices to hasten its progress will be found of considerable value. And now, the infant should not be permitted to use the milk of the affected breast any longer, because, with the milk, which has lost its nutritive qualities, it may be injured by the reception of pus into its stomach; the milk must be evacuated by other means. Fresh Poke-root roasted in hot ashes, in the same manner as the potato, until it is soft, then mashed and applied over the breast as a poultice, will materially forward the suppurative stage, though its action will produce more suffering than the poultices ordinarily employed for such purpose. The addition of pulverized Lobelia, moistened with a mixture of warm water and vinegar, to the roasted poke-root, will materially enhance its value.

"If the abscess is placed superficially, or on the anterior surface of the breast, and progresses with rapidity, not causing an undue degree of suffering, it will be better not to interfere with it, but to allow it to take its natural course.

If it be deeply situated, progressing al vere local
sufferings, and is attended with a high e perspi-
ration, and want of rest, much time will b iderable
suffering, by opening the abscess at the robe or
lancet, and permitting the pus to escape not to
be in such a hurry as to make an ed.
And always, in opening

the lactiferous vessels, so as to avoid dividing them, as much as possible.

"If there is a thick covering over the abscess, it is improper to penetrate it with the lancet, because the opening will not succeed in establishing a free discharge of matter, for as the aperture closes by adhesion, the accumulation of matter proceeds, and ulceration will continue. On this account, the opening should be made where the matter is most superficial, and where the fluctuation is distinctly perceptible, and its size should be proportioned to its depth.

When the abscesses are very deep, with several sinuses, the best mode of treatment, is to inject into them a solution of two or three drops of strong Sulphuric Acid in a fluidounce of Rosewater; and it may likewise be applied on folds of linen cloth over the bosom, by this the secretion of milk is checked, and adhesion is produced." (Sir A. *Cooper.*)

If the ulcer does not readily heal, or assumes an indolent character, apply some sesqui-carbonate of Potassa to it, and dress it with the red oxide of Lead plaster, or the compound Lead ointment, treating it similar to ulcers on other parts.

Should there be a troublesome oozing of blood from the wound made by the lancet, in opening the abscess, it must be treated by the application of dry lint, with sufficient compression.

In the inflammatory stage, the diet must be light and non-stimulating; during the suppurative discharge, a nourishing diet should be used, and to support the strength and aid in the formation of healthy pus, Port Wine and Cinchona, or the compound Wine of Comfrey, may be required. If there is exhaustion with considerable irritability of the system, Morphia and Quinia combined, will be found advantageous.

Beside MILK FEVER, which has been referred to on page 277, there are two other forms of fever which may be occasionally met with in practice. One is termed EPHEMERAL FEVER, or WEED, and is more especially met with in cold, moist weather, among those who reside in low, marshy places, or in the neighborhood of stagnant ditches. It may likewise be occasioned by cold, indigestion, constipation, fatigue, mental agitation, want of rest, and improper food. It appears usually in from five to nine days after delivery, and seldom continues over twenty-four or forty-eight hours, whence its name, ephemeral. It commences w

long-continued rigors, succeeded by heat and profuse persp

the shivering there will be pain in the back and var

system, shrunken features, eyes hollow, skin dry integuments at the fingers' ends livid and corrugated, thirst, rapid and perhaps irregular pulse, or feeble and indistinct; and various other distressing symptoms, which increase in severity as the rigors are about passing off. The hot stage is characterized by a throbbing of the temples; great heat of the surface; flushed face; severe headache, generally referred to the forehead and eyeballs; soreness of the breasts and of the abdomen; rapid, full, hard, and firm pulse; and a diminution of the various secretions, with occasional delirium. This is followed, after a longer or shorter time, by a profuse perspiration, which appears first on the forehead, neck, and chest, and which is succeeded by an abatement of the fever, and an amelioration of all the previous symptoms.

This disease may be mistaken for puerperal peritonitis; but the *violence* and *long-continuance* of the rigors, the absence of marked abdominal tenderness on pressure, and the very profuse perspiration which is followed by relief, will enable us to distinguish it, as well as the absence of a return of the paroxysms. It is seldom a dangerous disease, unless, by improper management, it be allowed to pass into a continued or intermittent fever.

TREATMENT.—The indications of treatment are to shorten the various stages of the disease as much as possible. During the *cold stage*, apply warmth to the surface, as bottles of warm water, or warm bricks, etc., to the feet, knees, thighs, and axillæ, and warm flannels over the stomach and abdomen; in addition to which, warm drinks and cordials may likewise be given; and, as the case may require, adopting other means similar to those which would be employed in the cold stage of ague. As the bowels are frequently constipated, an active purgative should be administered either in this or the subsequent stage; sometimes an emetic will prove advantageous.

In the *hot stage*, the surface should be bathed with warm, weak ley-water, and the Sulphate of Quinia exhibited in doses of one, two, or three grains, every two or three hours: it may be used alone, or in combination with the compound powder of Ipecacuanha and Opium. If there is much nervous irritability, the Valerianate of Quinia will be found a very beneficial agent; and this may be continued for some days after the cessation of the disease, to allay the irritability and lessen the disposition to any secondary attacks.

In the *sweating stage*, the Sulphate of Quinia may be continued alone, or in conjunction with Prussiate of Iron; and the patient should use cold, bitter infusions, as of Virginia Snakeroot, Boneset, Vervain, Chamomile flowers, etc.

The several symptoms which may present during each stage, must be met by measures similar to those employed when they occur in other febrile affections. After the paroxysm has ceased, the diet should be nutritious, with stimulants if there be much depression. Exposure to cold should be guarded against, or any other exciting cause of the disease; and it should be ascertained by a careful examination whether any derangement of the uterine system exists, that it may be promptly subdued.

The other febrile affection referred to above, is termed MILIARY FEVER: it is still more rarely met with than the preceding, though in former days it was quite common, and was considered a formidable disease. It may occur as a primary affection, and independent of the parturient state; but more usually it appears as a symptom connected with puerperal, milk, or ephemeral fevers, especially in those cases where perspiration is permitted to become too profuse. Females of debilitated constitutions are more subject to it than others. It generally occurs between the second and twelfth day of delivery, and may be excited by fatigue, relaxation, impure, over-heated air, stimulants, rich or improper food, excessive evacuations, constipation, and personal uncleanliness.

It commences with chills, succeeded by fever, and perspiration of an acid, penetrating odor. There is sickness and languor, with a hot skin, frequent pulse, depressed spirits or great anxiety of mind, a great weight about the chest, severe headache, dull and watery or inflamed eyes, with throbbings within the orbits, tongue furred white with raised papillæ and red edges, ringing in the ears, and occasionally aphthous ulcerations of the mouth and fauces. The lochial and lactiferous secretions are diminished or suppressed, and a pricking or itching of the surface is generally complained of; occasionally there is a sensation of numbness in the extremities. The perspiration is usually followed by no mitigation of the symptoms. After these symptoms have continued for a few days the skin begins to feel rough like the cutis anserina, and in a short time the eruption appears about the forehead, neck, and breast, from whence it gradually extends to the trunk and extremities: it rarely affects the face. It appears in the form of small, red, generally distinct vesicles about the size of millet-seed, having a red or inflammatory appearance surrounding their base. In a few hours the vesicles assume a white or yellow appearance, from the change effected in the lymph contained in them, and in a few days they dry up, and the crusts fall off in small branny scales. The eruption, unless the disease be primary, seldom affords any relief to the symptoms, and may occur frequently and irregularly, should the fever and perspiration continue. Occasionally, the eruption has been met with where but little or no fever was present. The disease is seldom serious, unless the perspiration be suddenly checked, or the eruption recede, under either of which circumstances fatal results may ensue.

The disease may be determined by the character of the tongue, the oppression at the chest, and the peculiar, strong, and sour smell of the perspiration.

TREATMENT.—Keep the room well ventilated and cool, gradually lessening the amount of bedclothes, but being extremely careful not to allow the patient to "catch cold." Give laxatives to keep the bowels regular, and when there is derangement of the stomach, an emetic may be useful. The drink of the patient should be cold and acidulated; or an infusion of Maidenhair and Elder-blows may be given, together with a bland, nutritious diet. Sulphate of Quinia will be found of much service, during the whole course of the disease.

On the abatement of the febrile symptoms, the diet may be improved and mild tonics employed. Should there be aphthous ulcerations, they may be washed or gargled with a strong infusion of equal parts of Golden Seal and Blue Cohosh roots, sweetened with honey; or a solution of Borax and Honey may be used. If the disease accompanies other affections, especial attention must be directed toward the treatment of these, for the secondary difficulty will continue more or less severe, until the primary one is subdued.

Women who suckle, or who have advanced to the latter months of pregnancy, are sometimes affected with a sore mouth peculiar to themselves, somewhat resembling follicular stomatitis, or follicular inflammation of the mouth; other females and men being exempt from it. It is generally known as the SORE MOUTH OF NURSING WOMEN. The most robust constitution, or the sickly and delicate, are indiscriminately attacked by it: those, however, of costive habits, dysp
toms, and hepatic affections, seem to be more liable to its
others. And when there is a tendency to phthisis, or
tional disease, the debility produced by it is of a m
nature, than in vigorous and sound systems. I h
with it in females who were liable to attacks of
those whose constitutions had been injured by the
the disease is allowed to go on for any length
relieved, the morbid irritation of the tongue

stomach and bowels, in which case it is apt to prove fatal. I have known the disease to terminate in death during the third, fourth, and fifth puerperal week, even after the child had been kept from the breast.

The children of females laboring under this affection are generally healthy and robust, being well supplied with milk, the secretion of which is commonly abundant until the last stages, when, the patient being reduced by starvation, this secretion fails. The means usually employed for common sore mouth, or follicular inflammation, will not effect any benefit in this disease, unless it be very mild; and, in many instances, an energetic treatment must be pursued, or the patient will die. Death has taken place within a month from the appearance of the disease, and, again, patients have lingered for three or four months before the fatal termination. It is a singular malady, nearly always disappearing upon weaning the child; yet weaning is not always necessary, nor is it at all desirable, as there is a greater disposition to a return of the disease at every future accouchement, than in those cases where proper treatment has effected a cure, and restored the constitution to its usual normal condition. It must be recollected, that in patients who have been cured of this disease, there will exist a strong tendency to its return from slight causes, at least until the child is weaned: as from exposures to cold, fatigue, indigestible diet, etc., and which in consequence, must be carefully guarded against.

The disease appears to depend upon gastric and hepatic derangement in connection with a vitiated state of the blood, and is more common to those subject to erysipelatous affections, or of strumous diathesis.

SYMPTOMS.—The accession of the disease is often very rapid from apparent health—extremely so: within three hours after seeing the patient in health, perhaps actively engaged in household matters, and not suffering from any unusual irregularity of the stomach and bowels, she will be found with a scalding of the tongue and fauces, and unable to converse or take food. The first sensation is uniformly described by the patient as a *severe scalding* of the tongue, with pain, at times intense. There is also a peculiarity of the tongue, its color, especially in the severer instances, being *pink;* and its edges and the roof of the mouth have a deeper hue of this color, often accompanied with a most profuse watery discharge from the mouth, extremely hot, so much so as to give a scalding sensation to the face when passing over it. The appetite is usually very good, often ravenous, but no food or drink, except the blandest, can be taken into the mouth without producing more or less intense pain: the food *must be* of a mucilaginous or farinaceous character. After a continuance of this state of the mouth for a few days or weeks, slight ulcerations on the end or edges of the tongue manifest themselves, as also about the different parts of the fauces. Sometimes the disease gradually commences with slight ulcerations on the tongue, and this general scalding of the tongue and fauces follows. The bowels are usually constipated, or soon become so; no fever, but at times excessive irritation of the whole system, in consequence, probably, of the want of rest; as the continued pain of the fauces, and the excessive and constant flow of burning saliva prevent any comfortable rest day or night. The tongue is generally free from any coat, or it may have a light, white one. Occasionally, although the surface of the ulcerations is not deep, yet they continue to increase in width, and the inflammation spreads all over the mouth. When it extends from the mouth and fauces to the bowels, diarrhea ensues, and usually, in such cases, the soreness of the mouth becomes better, but the case is attended with more danger. When the disease is severe there will be an anæmic condition of the system, with considerable prostration of the vital energies.

TREATMENT.—In the first two cases of this disease which I attended, having never seen a description of the disease in any medical work, I pursued the usual treatment for aphthous ulcerations, and lost my patients; since which, my success in the treatment of it has been such, as to justify me in recommending the following plan:

In the severe or obstinate cases, and if the strength or condition of the patient will admit, an emetic must be administered and repeated every three or four days; and it should be continued as long as the symptoms of the case, and the obstinately torpid condition of the liver require. The emetic I usually prefer is the compound powder of Lobelia. In the milder cases emetics may generally be dispensed with.

After the effects of the emetic have subsided, catharsis must be produced, which, however, must not be too active, and for which purpose either the compound powder of Jalap, compound powder of Leptandrin, compound pills of Podophyllin, compound pills of Leptandrin, or compound pills of Aloes, may be administered in sufficient doses; and, if the pills
be well swallowed by the patient, they may be dissolved in
triturated with some mucilage.

Internally, the tincture of chloride of Iron, may be giv
twenty drops in a sufficient quantity of some diuretic inf
should be repeated every two or three hours. Form
habit of administering alteratives, as the compound sy
compound syrup of Yellow Dock root, or the comp
with a proper proportion of Iodide of Potass

but, though these will be frequently found useful, I think the tincture of Iron above advised, will be found more generally successful, from its direct influence on the capillary vessels, and the beneficial action of the Iron in anæmia.

Sometimes diarrhea is present, in which case no purgative must be administered. The tincture of chloride of Iron in doses of ten drops, diluted sufficiently, and repeated every hour or two, will be found to have a most excellent influence over diarrhea, especially when used in conjunction with a stimulating and astringent injection, such as a mixture of Tannic Acid one drachm, compound tincture of Virginia Snake-root, Elm mucilage, of each, half a fluidounce. Mix for an injection, to be repeated immediately after each stool. Benefit may also be derived in diarrhea, from the following compound: Take of Rhubarb, prepared Charcoal, each, four drachms, bicarbonate of Potassa two drachms. Mix in a pint of Indian-meal gruel, and give a tablespoonful every hour or two, according to the severity of the disease. Rice-water, Elm-water, infusion of Blackberry root, or of other vegetable astringents, may be drank freely.

Any derangement of the kidneys, with scanty, high-colored, and scalding urine, will require diuretics, as an infusion of Marsh-mallow root, or of Hair-cap Moss, etc. Sometimes, the Canada Balsam will be beneficial.

In nearly all instances of this disease, a deficient action of the cutaneous vessels will be met with, and which it is absolutely necessary to remedy. If, as is sometimes the case, the disease comes on previous to parturition, or immediately succeeding delivery, the whole body and limbs should be bathed daily with a weak alkaline wash, to be followed after drying, with some stimulating application, as Whisky and Water, etc. And as soon after delivery as may be prudent, the Spirit Vapor-bath[°] should be administered twice a week, or according to the strength of the patient. Attention to the surface is an *exceedingly important* part of the treatment.

[°] I dislike this name very much, from the fact that there is but very little vapor of spirit given off; the spirit by being burned, heats the air, and it is the heated air which occasions the perspiration. The term *hot-air bath* would be preferable. There are many other matters of a similar nature to which I would invite the attention of the profession, for instance, the names "antibilious physic," "pulmonary balsam," "scrofulous syrup," "sudorific tincture," "ague bitters," "vegetable caustic," "compound cathartic pills," "irritating plaster," etc., all strongly savor of empiricism, and are calculated to impede rather than advance the interests of our cause. I hope sufficient notice will be taken of these brief suggestions to cause our friends to omit the use of all such vague, indefinite, and unscientific terms, and employ a nomenclature better adapted to true medical science.

The aphthous condition of the mouth and fauces must also be attended to locally. A solution of Nitrate of Silver, from sixty to eighty grains of the salt to a fluidounce of water, will generally be found useful in allaying the more severe scalding and painful sensations; the whole internal surface of the mouth should be washed with it once every day, or every other day, and it will be best to apply it at bedtime, that the female may obtain some sleep afterward. During the day, the mouth and throat must be frequently washed or gargled with one of the following preparations, a small portion of either of which, say a teaspoonful, may be occasionally swallowed with benefit:

1. Take of Geranium Maculatum, Baptisia Tinctoria, Caulophyllum Thalictroides, Hydrastis Canadensis, each, one ounce. Place the whole in four pints of water, and boil down to two pints, strain, and add half an ounce of Borax, and half a pint of Honey.

2. Take of Polygonum Punctatum two ounces, Ligustrum Vulgare, Hydrastis Canadensis, Ambrosia Trifida, each, one ounce. Prepare as in the preceding.

3. Take of Geranium Maculatum, Statice Caroliniana, Baptisia Tinctoria, Hydrastis Canadensis, each, one ounce. Prepare the same as the preceding.

Undoubtedly, other astringents, and agents which influence mucous tissues, will be of value.

The diet should be light and easy of digestion, avoiding fats, stimulating liquors (though wine is indicated when there is great prostration), gross diet, and everything which will cause acidity of the stomach, or in any way retard or derange the digestive functions.

It is always advisable to cure this affection, if possible, without weaning the child, as the female is thereby rendered less liable to its recurrence at another parturient period. But, if the soreness and pain are excessively intense, and appear to be intractable to all treatment, and more especially when diarrhea is present, weaning may become absolutely necessary, in order to save the patient's life. In these cases, and also where a strong disposition exists to a return of the disease at each accouchement, it may be entirely cured, checked, or its severity very much ameliorated, by regulating the bowels during pregnancy with the compound powder of Rhubarb, and preserving, as much as possible, a normal condition of the system, by some alterative treatment persistently used during the whole period of gestation.

INFANTILE AFFECTIONS.

It may be proper, before concluding the work, to make a brief reference to those diseases, and their treatment, which are more frequently met with in the early weeks of infancy, and which the obstetrician is almost always expected to attend.

CHAPTER LI.

CYANOSIS — RETENTION OF URINE — RED GUM — JAUNDICE — INFANTILE OPHTHALMIA — FLATULENT COLIC — CONSTIPATION — UMBILICAL HERNIA — EXCORIATION OF THE NAVEL — HEMORRHAGE FROM THE CORD — HEMORRHAGE FROM THE NAVEL — NÆVUS MATERNI — TONGUE-TIED — HYDROCELE — SWELLING OF THE BREASTS — HARE-LIP.

As soon as the child is born, and breathes, a change is effected in its circulation; the blood which had partly circulated from the right into the left auricle, through the foramen ovale, during intro-uterine existence, as well as that which had flowed through the ductus arteriosus, from the pulmonary artery into the aorta, now changes its direction and flows toward the lungs, through the pulmonary artery. However, cases are occasionally met with, in which no change of this kind is effected, and the blood continues to pass from the right to the left side of the heart. From this circumstance, the blood is imperfectly oxygenized, as manifested by the livid or blue color of the lips and other parts of the body which are protected by only a thin cuticle. This condition is termed *Blue Disease*, *Morbus Cœruleus*, and *Cyanosis*.

The two auricles of the heart form nearly a single cavity, at the fifth month of pregnancy, in consequence of the imperfect development of the septum auricularum; but this septum gradually matures until at full term the foramen ovale is generally considered to be nearly or quite occluded.

Cyanosis may be occasioned by a patulous condition of the foramen ovale, or by some malformation, as, deficient ventricular septum, constricted pulmonary artery, or any other abnormal conditions of the heart or its bloodvessels; frequently, the foramen ovale may continue open after birth, or it may re-open; and, anything which interferes with the return of the blood to the heart, preventing the formation of arterial blood, may give rise to the blue color observed in this disease.

The *symptoms* of cyanosis are a violet, blue, or purple color of the surface of the body, especially the face, lips, hands, feet, and genitals, and which color becomes increased by exertion or excitement. In addition to this, indications of cardiac disease are present, in a greater or less degree, as, paroxysms of dyspnœa of long or short duration, palpitation, and sometimes syncope, diminished temperature of the surface, and an extreme susceptibility to the influence of cold, with a strong disposition to serous effusion. The child is most commonly dull and sleepy, its respiration being slow, and frequently labored, and eventually spasms and convulsions occur previous to the fatal termination. However, it must be borne in mind, that perfect oxygenation of the blood is less important to an infant than to an adult, and infants have, at times, presented symptoms of imperfect oxygenation of the blood, without any detrimental results.

Post-mortem examinations have, in the majority of deaths by cyanosis, discovered some malformation of the heart, its bloodvessels, or of both. Meckel states, that "even when the foramen ovale has remained open, there may be no cyanosis, if the pulmonary artery is properly formed"—and Corvisart asserts, that "cyanosis may be present when there is no communication between the ventricles."

TREATMENT.—Although cures have been effected in this disease, yet we are not to anticipate such results as a general rule, and especially if the infant be attacked with spasms or convulsions.

It is always proper to attend to the position of the child, as recommended by Prof. Meigs, which is, to place it on its right side, with the body inclined at an angle of 30°, the head being the highest part. On a moment's reflection it will be seen that the anatomical, as well as the mechanical relations of the parts, indicate this position, which maintains the left auricle perpendicularly above the right, and the blood must thereby gradually pass into the pulmonary ventricle, from the force of gravity alone. Yet, in cases depending upon malformation, no benefit could result from this or any other position.

In connection with this position, the child must not be allowed to cry or worry, but should be kept as still as possible, and its body should be occasionally bathed with tepid water. Should the natural color of the skin return after several hours, with a freer respiration and a cessation of spasmodic action, all that will be necessary in the way of medicine, is a gentle purgative, or two.

In many cases the disease terminates fatally in a few days, and, sometimes, not until after several months; the affected individual seldom reaches the period of maturity. Whenever the disease does not destroy the patient after a few weeks, there may possibly be some benefit derived by treating him for a chronic disease of the heart.

Sometimes, an infant will pass many hours after its birth with a RETENTION OF URINE. This may be owing to the fact that none has been secreted; to an obstruction or debility of the parts concerned in ejecting the urine; or, to some malformation, or closure of the urethra. The first cause, may be overcome by the exhibition of mild diuretics, as, infusion of Marshmallow, Parsley root, Pumpkin seed, or Watermelon seed. The second, by placing the child for a short time in a warm bath, and then, after drying it, applying pounded Garlic, or Onions over the region of the bladder. The third case will require a surgical operation for its removal, according to the character of the difficulty.

A few days after birth, infants are attacked with a cutaneous affection, called RED GUM (*strophulus intertinctus*). It is a slight eruption of red, or sometimes whitish pimples, which are surrounded by a reddish halo. This is probably occasioned by the exposure of the surface to the action of the atmosphere, and other external stimulating influences, as well as to changes effected in the capillary circulation by the increased oxygenation of the blood. It is of no importance and requires no especial treatment. The skin should be frequently powdered with Arrowroot, and if there be any derangement of the digestive functions, it may be remedied by a careful exhibition of the compound syrup of Rhei and Potassa. Nurses are frequently in the habit of giving an infusion of Catnip and Saffron, for this affection, and as no harm can be effected by it, a prohibition would not always be prudent.

Infants are likewise liable to a yellowness of the eyes and skin shortly after birth, termed JAUNDICE; and with this, the urine may also be so colored with bile as to leave yellow stains upon the diaper. Ordinarily, this is of but little consequence, and is generally treated by an infusion of Saffron and Catnip. But when the stools denote biliary derangement, being whitish, clay-colored, or whitish-yellow, it may be overcome by the exhibition of the compound syrup of Rhei and Potassa, either with or without an infusion of Leptandra Virginica. The surface should be kept clean by daily bathing. Sometimes, however, in consequence of malformation, or disease of the liver or its ducts, a true jaundice may exist, and which is apt to be of a serious nature; but this is not of very frequent occurrence.

Shortly after birth, say on the second or third day, and sometimes later, infants are frequently attacked with OPHTHALMIA (*ophthalmia* *purulenta infantum*, or, *oph. neonatorum*). It commences with a redness and swelling of the lids, and, on awaking, the lids will be observed to slightly stick together. Light occasions pain, and consequently the child keeps its eyes closed. At first, a little whitish matter will be observed lying on the inside of the lower lid, and subsequently a profuse and constant discharge of thick, yellow matter takes place, and which covers the whole eye. If this be allowed to continue without attention, the child may ultimately lose its eye. The *treatment* will consist in emollient poultices to lessen inflammatory action, and a frequent bathing of the eye with an infusion of Hydrastis Canadensis two parts, Geranium Maculatum one part—mix. If a more stimulating application is required, eight or ten grains of the sesquicarbonate of Potassa may be added to a fluidounce of the infusion. The bowels should be kept regular. Other local applications may also be used with benefit, as the Borax lotion with Morphia, compound lotion of Golden Seal, compound Myrrh lotion, or compound Soda lotion.

Infants are frequently troubled with FLATULENT COLIC, which may arise from costiveness, exposure to cold, from being allowed to suckle too much, from irregularities in the diet of the nurse, or some bad quality of her milk. It usually comes on suddenly, and may be known by the violent and incessant screaming of the child, the hardness of the abdominal muscles, and the constant agitation of the limbs, which are extended to their utmost, and then immediately drawn up toward the abdomen, in rapid succession.

The TREATMENT consists in giving a laxative and carminative injection, after which a warm infusion of Peppermint (or Spearmint, should a suppression of urine be present), sweetened, and to which a very small quantity of supercarbonate of Soda has been added, should be given, as an increased acidity of the stomach is apt to be present; or, the compound syrup of Rhei and Potassa may be substituted, when further action on the bowels is desired. When the attack is very severe, the bowels and back of the child should be covered with flannels or fomentations, made as hot as can be borne, and the child being held with its abdomen on the nurse's knee, should be *trotted* for some time, while she gives a succession of light taps with her hand on its back, between the shoulder-blades and down to the small of its back. By this means, I have frequently removed the most severe cases of colic, where the child had been screaming incessantly for hours, and had taken Paregoric, Godfrey's cordial, hot Gin Sling, etc., without the least benefit.

When an infant is subject to flatulent attacks, it may be overcome by the administration of an infusion of Pleurisy root, Hops, each two parts, Valerian, Scullcap, each one part, Anise, three parts, sweetened with molasses; from ten to sixty drops may be given for a dose. Godfrey's cordial, Paregoric, etc., are excessively injurious, especially when used persistently for many days. An attention to diet, cleanliness, the condition of the bowels, and exercise, is always required, when the child is liable to a flatulent condition of the alimentary tube.

CONSTIPATION, is common to some infants, and often proves obstinate, being rather perpetuated by the administration of purgatives. The introduction of a suppository of soap is, generally, the best agent that can be used in order to procure a stool; two evacuations should be obtained daily, at regular hours. And in the interim, the following should be injected into the rectum, three or four times daily, and retained within as long as possible, by means of a compress, if necessary: Take of a strong infusion of Hydrastis Canadensis, two fluidrachms, tincture of Prickly-Ash berries, twenty or thirty minims; mix for an enema. This gives tone and activity to the parts with which it comes in contact, and also to neighboring parts by sympathetic action. Internally, in very obstinate cases, an infusion of Leptandra Virginica, sweetened with molasses, may be given in doses of from ten to sixty drops, according to the child's age, and which should be repeated two or three times a day, for a number of days, or even weeks, in succession.

UMBILICAL HERNIA, may occur soon after birth, or at a later period. It may be occasioned by a large umbilicus, or, from straining while crying, coughing, etc. It should always be attended to at once. Place the child on its back, with the shoulders slightly elevated, and the thighs flexed toward the abdomen. Then carefully push the protruding tumor back, apply a compress over it, and maintain it in place by a bandage. In some instances, an umbilicus truss may be required, several kinds of which are in use, but I prefer those manufactured by Mr. Marsh, of N. Y., and sold in this city by Mr. Corliss on Fourth street. The compress, above advised, may be made of linen, folded several times, and moistened with some astringent; or, a piece of cork, may be cut of the proper size and shape, covered with linen or soft leather, and applied. Adhesive inflammation, sufficient to unite the parts, will take place in four or five days, though the treament should be continued for twelve or fourteen days; and after this period has passed, the abdomen should be properly supported by a bandage, for several months, in order to prevent a return of the rupture; and constipation should carefully be guarded against by proper laxatives, etc.

EXCORIATION OF THE NAVEL, may be successfully treated by washing the part twice a day with some Castile soapsuds, and then dressing it with the red oxide of Lead plaster, or, the compound Lead ointment. If there is a tendency to gangrene, sulphate of Zinc, either in powder or solution, may be applied, together with emollient poultices; and the strength of the system should be kept up by tonics.

Sometimes, from a shrinking of the umbilical cord, or from its being carelessly tied, the ligature will not press sufficiently on its bloodvessels, and a HEMORRHAGE will take place. In such cases, a second ligature must be applied below the original one, and which should make the proper compression upon the vessels without cutting the cord.

Occasionally, at the time of the separation of the cord from the navel, or a day or two subsequently, HEMORRHAGE FROM THE UMBILICUS, will ensue, being frequently accompanied with fungus growths. This difficulty may be overcome by the application of sulphate of Zinc, either in powder or in solution, followed by the red oxide of Lead plaster, or, compound Lead ointment; and, if much inflammation be present, emollient poultices should be applied.

NÆVUS MATERNI, or *mother's marks*, are frequently met with; they may exist on any part of the body, and present various appearances, some being better supplied with blood than others. When they are superficial, manifesting no tendency to spread, no treatment is required, except to remove the disfiguration from the face. When they are of the character of "aneurism by anastomosis," having a tendency to spread or enlarge, to ulcerate, or to bleed profusely, it is advisable to remove them when possible.

Various modes of TREATMENT have been recommended for the removal of these marks, to which I will merely make a brief reference; as, destruction of them by the application of platinum wire, heated by galvanism; the injection of a small quantity of the solution of perchloride of Iron into various parts of the nævus; the application of the ligature to some varieties; the application of intense cold over the part; and, in the subcutaneous form, it has been removed by vaccinating in the mark. The application of powdered sulphate of Zinc over the nævus, repeated daily, and continued until it is destroyed, then facilitating the removal of the slough by an Elm poultice, and subsequently treating the ulcer with the compound Lead ointment, has succeeded in several instances in effecting a cure, even in cases where the nævus assumed a malignant appearance. If not removed after the slough has passed off, renew the application of the Zinc, and follow by the same treatment as above.

Infants are occasionally troubled with a condition, known as being TONGUE-TIED. This arises from the frænum linguæ, or bridle under the tongue, being so short, or attached so far forward as to interfere with the motions of the tongue in sucking, as well as in speaking, when further advanced in years; occasionally, it is owing to the presence of a false membrane. If the infant can protrude the tip of the tongue beyond the lips, or can suck well, no interference is demanded, for there is no difficulty of the kind. It is of very rare occurrence.

The TREATMENT consists in cutting the frænum, so as to loosen the tongue from its attachment. The best time for operating is when the infant sleeps; the tongue may then be held up with the index or fore-finger of one hand, while with the other, holding a pair of blunt scissors, and having its points directed downward and as near the floor of the mouth as possible, cut loose about one-eighth of an inch of the anterior portion of the membrane—and which will be followed by only a few drops of blood which must be wiped out. Care must be taken not to cut the lingual artery, which is situated on the inferior surface of the tongue; and, should it be imprudently cut, the hemorrhage must be checked by compression, or the actual cautery. If too extensive a cut be made, the child may swallow its tongue, which, however, may be returned, by passing a spoon dipped in molasses or syrup down to the point or edges of the organ, and bringing it back.

HYDROCELE, is sometimes met with in infants, and is generally removed by the application of compresses moistened with a solution of Muriate of Ammonia. It is rare that a puncture will be required.

Infants, soon after birth, are sometimes troubled with a SWELLING AND HARDNESS OF THE BREASTS, which may be owing to cold, blows, bruises, or, an excited condition of the parts. It may be overcome by gentle frictions with Olive oil and tincture of Camphor applied two or three times a day, employing in the intervals fomentations of Mullen leaves and blossoms, or, of the flowers of St. Johnswort; if there is much inflammation, poultice of Elm and Lobelia may be applied. Occasionally, and especially if neglected, or improperly treated, sloughing will take place; this may be treated by stimulating washes, and the

Red Oxide of Lead Plaster, in conjunction with tonics internally, when there is much debility.

HARE-LIP, is an imperfection often met with after birth. It is a perpendicular or oblique division of the upper lip, either immediately under the septum of the nose, or under one of the nostrils. Double hare-lip is when there are two divisions. Sometimes the fissure extends back through the palate bone, as well as through the soft palate, in which case, an operation has sometimes been performed, which may be found described in surgical works.

In ordinary cases of hare-lip the deformity is removed by a simple operation; and, on account of the tendency to convulsions in very young children, after the operation, it is better to wait until they are at least two or three weeks old; a year or two is still better, if the child can suck, or be safely fed in the meantime.

The operation is performed, by removing the edges of the fissure with a scalpel, or bistoury, cutting upon the part while a flat piece of wood is held between the lip and the gum; some prefer incising the edges with a pair of long-handled, sharp scissors, made for the purpose. Should the gum and lip be adherent, they must be separated by the knife; and when the frænulum is in the way of the operation, it must be divided. The incision, by whatever instrument it is effected, should be as smooth and even as possible, that the edges may readily unite by the first intention.

The fissure, now resembling the inverted letter ʌ, is to be closed, bringing its edges together, through which three flat needles are to be passed. It is better to have gilt needles with movable steel points, on account of the steel needles being liable to rust, and they should be oiled before introducing them. The first needle should be introduced through and across the wound at its inferior or lower termination; it should penetrate sufficiently deep, say about two-thirds through the substance of the lip, to keep the cut surfaces in approximation, but should not pass through the inner surface of the lip. One or two other needles are then to be passed similarly, at equidistant points from the first needle, being thrust, as before, sufficiently deep to almost reach the inner mucous lining of the lip. A ligature, or common waxed thread is to be repeatedly wound round the ends of the pins, forming a twisted suture, so as to keep the outer surface of the wound in close contact, being careful, however, not to apply it so tightly as to occasion a subsequent sloughing of the parts. Should high inflammatory action supervene, it may be reduced by the application of cold water; and any tendency to cerebral irritation, or sympathetic fever, should be at once removed by appropriate means.

The child should be kept in a room, away from any excitement which would occasion crying or laughing, and even talking when old enough, and must be fed with a spoon, the diet being entirely of a fluid character. And should there be any danger of a disarrangement of the parts, the cheeks may be pressed forward, and then a long strip of adhesive plaster, reaching from ear to ear, may be applied between these points and over the lip.

After four, five, or six days, the needles may be removed, and strips of adhesive plaster applied, which will be sufficient to hold the parts together. In removing the needles, loosen them gradually, with the forceps, as any sudden jerks, or forcible pulling, would be apt to separate, or otherwise injure the wound. If there be a double hare-lip, it will be better to complete the operation by incising and ligaturing both fissures at the same time.

CHAPTER LII.

APHTHÆ, THRUSH—TRISMUS NASCENTIUM—PORRIGO LARVALIS, MILK SCAB.

INFANTS are subject to an inflammation of the mouth, called APHTHÆ, *Thrush*, or *Stomatite Folliculeuse*, the symptoms of which vary according to the severity of the attack. Upon an examination, the tongue, lips, and interior surface of the mouth and throat, will be found more or less covered with small, white flakes, or pearl-colored vesicles, which proceed to superficial ulceration, and terminate by an exfoliation of white crusts. These vesicles may be distinct, or confluent, and in the more severe forms, are accompanied with so much pain that the child can not suck, its mouth is hot, its lips frequently swollen, with a dribbling of saliva. The breath is usually disagreeable and of an acid odor, the pulse quick and feeble, bowels deranged, frequent vomiting, and a diarrhea with green or watery evacuations, and excoriated anus. The disease may extend to the pharynx, and trachea, and, in very severe cases, it is continued through the alimentary canal to the anus. The child becomes pale, restless, and fretful, rapidly emaciating, and presenting a countenance indicative of much distress. When mild, but few of these symptoms are manifested; but when very severe, there may also be cephalic disturbance, severe abdominal pain, diarrhea, and typhoid symptoms, under which the little patient will rapidly sink. Occasionally, the ulcers assume a gangrenous condition.

Weakly and unhealthy children, as well as those raised by hand, are more subject to this disease than others; it may also be induced by improper food, uncleanliness, unhealthy air, and not unfrequently occurs as a secondary affection to other diseases.

It is sometimes mistaken for a disease occasionally met with, called *White Thrush*, or *Muguet*, but may be distinguished, by remembering that this latter affection presents no ulceration, being a deposition of curdy matter or false membrane upon the epithelium, without involving the destruction of the subjacent membrane; while in true Thrush, the follicular points of the tongue enlarge, without losing their circular form, and from their central orifices a whitish matter escapes, being accompanied by ulceration. The ulcer has rounded edges, is more or less tumefied, and is invariably surrounded by an inflamed red circle.

In the mild form, the white crusts fall off, and in a few days the ulcers heal. But when the aphthæ are confluent, with extensive ulceration, vomiting, and diarrhea, or when the crusts, instead of being white, are of a dark color, with an unhealthy appearance of the ulcers, the pulse being quick and feeble, with rapid emaciation, the prognosis is very unfavorable.

TREATMENT.—In the milder forms of this disease little or no treatment is necessary, but in the severe forms it is indispensable. The treatment should be commenced by the administration of the compound syrup of Rhubarb and Potassa, in laxative doses, for the purposes of removing any morbid accumulations which may exist in the alimentary tube, to neutralize any existing abnormal acidity, to aid in the expulsion of flatus, which is common to the disease, and especially to exert a normal influence on the hepatic and digestive functions. After and during the action of the laxative,—which should be exhibited daily, at least for a few days,—two or three drops of the tincture of chloride of Iron should be given in a sufficient quantity of infusion of Hydrastis Canadensis, and this may be repeated every two, three, or four hours, according to the severity of the disease. I have heretofore made a brief reference to the action of this chalybeate, so that it will be unnecessary here.

The mouth should be frequently but *lightly* washed with a strong infusion of equal parts of Hydrastis Canadensis and Caulophyllum Thalictroides, to which some Honey and a small portion of Borax have been added; and a portion of this may be occasionally swallowed, especially in the severe cases, with advantage. Care must be employed not to irritate the mouth by rough swabbing, or by forcing off the white flakes or deadened epithelium, as either of these may augment the severity of the disease. There are other agents which may be used with advantage as local applications; thus, an infusion of Ligustrum Vulgare, or Hamamelis Virginica, a solution of Alum, or Nitrate of Silver, etc.; but I prefer the above, which I have employed with much success for the last eighteen years, always administering some of it internally.

When vomiting occurs, an infusion of burnt bread or parched corn will have a tendency to check it; and if the irritation has extended into the stomach or alimentary canal, Salad oil may be used with benefit in small doses. Perhaps Cod-liver oil, or Cocoanut oil, might be useful in some cases. When the ulcers assume a dark or brown hue, or exhibit a gangrenous tendency, equal parts of Salad oil, Yeast, and Spirits of Nitric Ether, may be given in doses suited to the child's age, and which should be repeated at proper intervals. In addition to this the system should be supported by Quinia and cordials, as wine-whey, milk and wine, chicken-broth and wine, etc. Sometimes the Iodide of Potassium, combined with some alterative, will be found valuable, especially in children of scrofulous parents.

When there is excoriation of the anus, it should be frequently and gently bathed with warm water, dried carefully, and then sprinkled with equal parts of Lapis Caliminaris and finely powdered Elm Bark.

The body of the child should be kept clean, frequently bathing it with warm water, or a weak alkaline solution; and if it be much debilitated, brandy or some other stimulant may be added to the solution. Attention should be paid to the condition of the mother's health, who must be placed under treatment if necessary: her diet must invariably be regulated, as well as the condition of the bowels, exercise, etc. It not unfrequently occurs, that a change of the nurse, or weaning the child and feeding it cow's milk, arrowroot, barley-water, etc., will be followed by a disappearance of all the symptoms; shortly after which if the mother's milk has not been allowed to "dry up," it may be safely restored to its natural food.

The Persesquinitrate of Iron has been highly recommended in this affection. Take of solution of Persesquinitrate of Iron forty drops, syrup of Orange Peel half a fluidounce, Water five and a half fluidounces: mix, and give one-fourth for a dose to a child three or four years old, repeating it four times a day.

Recent microscopic investigations are stated to have discovered that the disease [illegible] upon a vegetable parasitic growth, and may be [illegible] lication and internal administration of a solution [illegible] in some bit[illegible]onic infusion. I have never used either of these agents, though they may probably be very valuable in the treatment of this affection.

TRISMUS NASCENTIUM, or NINE-DAY FITS, is a disease which seldom occurs in private practice, and which has heretofore most commonly proved fatal. It is peculiar to hot climates, and is more frequently met with among the infants of the white and black laboring classes.

The causes of this affection are very little understood, and have given rise to much speculation: it has been attributed to constipation, to vitiated air, to uncleanliness, to intoxication and irregularity of diet in the nurse, etc. More recently attention has been called by Dr. Sims to pressure upon the brain by the occipital bone, as a cause, and which is occasioned by the child's being allowed to lie for a long time upon its back, as is the case with slaves, and those who, being compelled to labor, cannot bestow the necessary attentions upon their infants: in this dorsal decubitus the occiput is made to pass under the parietal bones, and compress the brain to a greater or less degree. Dr. Sims adduces many cases in support of his theory, in which a mere change of position effected cures.

Colles, Billard, and several others, attribute the disease to inflammation and ulceration of the umbilicus, and instances are brought forth in which the traumatico-tetanic condition of the umbilicus appeared to be the exciting cause.

The affection is of a tetanic character; and as the infantile nervous system is extremely susceptible to impressions, it is very probable that various exciting causes may have produced the malady, among which the last two named may be the most common.

The attack usually manifests itself on the eighth or ninth day after the division of the funis. The precursory symptoms are thus given by Dr. J. Clarke:—"A livid circle around the eyes, sudden changes of color, a twisting of the limbs without cause when awake, screwing up the lips like a purse, involuntary smiling, with a peculiar kind of screech: the child is greedy, and the bowels easily moved, with natural, greenish, slimy, or knotty evacuations.

"With one or more of the symptoms, and sometimes without any warning whatever, the child is seized with violent irregular contractions and relaxations of its muscular frame, particularly those of the face and extremities. These convulsive motions recur at uncertain intervals and produce various effects. In some the agitation is very great: the mouth foams; the thumbs are riveted in the palms of the hands; the jaws are locked from the commencement, so as to prevent the action of sucking or swallowing; and any attempts to wet the mouth or fauces, or to administer medicines, seem to aggravate the spasms very much; the face becomes turgid and of a livid hue, as well as other parts of the body; and in from eight to forty hours the child dies."—(*Churchill.*)

TREATMENT.—It will be well to ascertain the condition of the occiput, whether it has passed under the parietal bones, and is compressing that portion of the brain, and also whether the infant has been lying continuously upon its back: if such be the case, its position must be changed from the back to the side, and on the right side will be the best. Attention should also be directed to the condition of the umbilicus, if it be ulcerated or inflamed; or if, on pressure, pain is manifested by the movements of the child, a poultice of Elm and Lobelia should be applied, and which must be changed three or four times a day. If a gangrenous condition of the umbilicus is observed, a solution of Sulphate of Zinc, half a drachm or a drachm of the salt to a fluidounce of water, should be applied, and its use persevered in until healthy granulations make their appearance: the solution may be applied on lint, and should be covered with the above poultice.

The child should be kept clean and dry, removing it, if necessary, to a purer atmosphere; keeping its bowels regular by the compound syrup of Rhubarb and Potassa; applying moderately cold water to the head; and bathing along the whole spinal column and inferior extremities with the compound liniment of Oil of Amber, which may be repeated two or three times a day. An infusion of equal parts of Symplocarpus Fœtidus, Cypripedium Pubescens, and Scutellaria Lateriflora, should be given every hour or two, either by mouth or by injection, and to each dose of which from five to ten drops of the compound tincture of Lobelia and Capsicum may be added.

Among the several cutaneous diseases to which infants are liable, is one known as *milk scall*, or *milk scab*, and which has been variously termed by writers, thus, *Porrigo Larvalis*, *Crusta Lactea*, *Porrigo Favosa*, *Tinea Lactea*, etc. The disease is usually first observed upon the forehead and cheeks, and consists in an eruption of minute superficial pustules, of a yellowish white color, united in groups on a red surface, and more or less confluent. It sometimes attacks the hands, feet, and other parts of the body, and has likewise been observed in adults. The pustules will at first be found to contain a transparent fluid, which soon becomes yellowish-white and opaque, and being discharged, concretes into thin, yellowish, or greenish crusts. As the pustular patches spread, there is a renewal of the discharge, which likewise continues from beneath the crusts, increasing their thickness and extent. The eruption is subject to various modifications — sometimes the discharge is scarcely perceptible, with a dry and brown scab covering the surface; at other times, the discharge is profuse, with a red and excoriated surface. Occasionally, the whole face, with the exception of the nose and eyelids, is covered like a mask, with a large, thick crust, formed of numerous smaller ones, and, almost invariably, the disease is accompanied with intense itching, and more or less pain. When the disease is about terminating, the discharge gradually ceases, the crusts fall off and are not renewed, the surface under them, at first elevated, red, and tender, gradually lessens in color, slight desquamation ensues, and the skin slowly returns to its normal condition without any disfiguration, unless the child has been allowed to tear its cheeks by scratching.

The duration of the disease is variable, and it is not uncommon for it to remain several months before disappearing. It rarely remains beyond the period of teething, and hence, in obstinate cases, means should be employed to allay the itching, that the face may not be marked by the nails of the child. It does not appear to be contagious; and its causes are involved in much obscurity.

TREATMENT.—I have, within the last five or six years, been called to treat quite a number of cases of this disease; at first, I was not successful, but have recently found the following means to be efficacious.

If there is any derangement of the digestive or hepatic functions, administer laxative doses, every day or two, of the compound syrup of Rhubarb and Potassa. Give daily, three times a day, from five to ten or fifteen drops of the following preparation, according to the age of the child: Take of saturated tincture of Cimicifuga, saturated tincture of Ptelea Trifoliata, equal parts; mix. Administer this in some sweetened water, adding to each dose from one to three drops of the tincture of chloride of Iron. The diet of the child should be regulated as to quantity, and the periods of feeding; in several cases, the disease proved unyielding until the child was given to another nurse, when it rapidly disappeared. As a local application, I know of none equal to the following: Take some fresh leaves of the herb Viola Tricolor, kn
various names of Tricolored Violet, Heartsease, Herb T
etc., add these to some good cream, and simmer togeth
ment is made, strongly impregnated with the vir
To one ounce of this ointment add three drach
(*Liquidum Liquidambar Styracifluæ*), and mix t

heat. The face should be lightly washed with Castile soapsuds, carefully and gently dried, and the ointment applied; and this should be repeated two or three times daily. Tallow may be substituted for the cream, and Liquid Storax for the Sweet Gum, but they will form an inferior compound.

The child should be exercised freely by its attendant, and be exposed as much as possible to the open atmosphere.

For the last twenty years I have met with an extraordinary success in the treatment of cutaneous cancer, scald-head, barber's-itch, and various other diseases of the skin, by the application of a solution of Oxalic Acid, of greater or less strength; and, more recently, those of my colleagues, and others in the profession, to whom I have made its virtues known, have employed it in similar diseases, and with like results. I have no doubt that this agent would prove very efficacious in the disease under consideration, but, at the same time, I should hesitate to employ it on infants for fear of some serious results. Probably, a solution of Citric Acid might answer as a useful and a much safer remedy. The formula for oxalic acid is $C_2 O_3=36$; that for citric acid is $C_{12} H_5 O_{11}=165$.

CORYZA, *Nasal Catarrh*, or *Snuffles*, is a very common and troublesome disease among infants. It is an affection of the nasal mucous membrane and air passages of the head, and generally commences by frequent sneezing; at first there is little discharge from the nostrils, but in a short time, a thin mucous secretion takes place, which finally becomes profuse, and of a thick, muco-purulent character. Not unfrequently, the discharge is acrid and irritating. The mucus fills the passages, forming a very troublesome obstruction, causing the child to make a snuffling or rattling sound in breathing through the nose, and interfering with its free respiration while sucking. The eyes are more or less suffused, watery, and sensitive to light, and the thirst is increased with some slight febrile disturbance. Sometimes, especially when the disease appears epidemically, the symptoms are much more severe, with great constitutional debility. After the third or fourth day the symptoms usually diminish, but, and especially when not under treatment or in the severe forms, it may continue for several weeks.

Coryza is usually produced by cold; at times it prevails as an epidemic; and it is frequently found accompanying other diseases, as the exanthemata. Usually, the disease requires but little treatment, but in its severe forms, it must be watched, as the child may die from the bstruction preventing free access of atmospheric air to the lungs.

TREATMENT.—In the mild forms, a gentle purgative, warm baths, with warm diaphoretic drinks, will be found sufficient; with, perhaps, a warm fomentation to the nose and forehead, or, what I consider still better, an application of goose-grease, or tallow. This greasing of the nose and forehead externally, is a common practice with nurses, and I have found it decidedly beneficial; and, notwithstanding many of our eminent practitioners treat with disdain the simple measures advised by old nurses, it is well to remember that they are more observing of, and have better opportunities to ascertain, the influence of agents upon children than physicians, who seldom remain with a patient to exceed fifteen minutes at a visit; and he who will listen to, and watch the opinions and methods adopted by them, especially in the management of infants, can never fail to derive some useful and valuable suggestions.

In the severe forms of this disease, it may be proper to commence the treatment by an emetic, for which purpose I prefer the compound tincture of Lobelia. The emetic should be followed by a mild purgative, after which moderate diaphoresis should be produced and maintained by some warm drinks, aided, in some instances, by the compound tincture of Virginia Snakeroot. To relieve the nasal obstruction, and lessen the inflammation of the mucous membrane, the compound tincture of Golden Seal, either pure or diluted, should be frequently introduced into each nostril, as far as necessary, by means of a camel's-hair pencil.

When the disease occurs as an epidemic, a solution of sulphate of Quinia may be administered, together with an infusion of Hydrastis Canadensis and Cimicifuga Racemosa.

When the nose is much obstructed, the infant should be taken from the breast for a few days, and be fed at regular intervals, two or three times a day. Children of advanced age should be kept on a low diet during the first stage of the disease. The surface should be bathed with warm water daily, the body should be kept properly warmed, and a flannel cap should be worn, not only during the disease, but for some days after its cure.

PART VI.

OBSTETRIC MATERIA MEDICA.

SINCE having prepared the previous pages of this volume, it has been suggested to me by many medical friends, to add a list of agents more especially adapted to obstetric practice, in order that the student may at once refer to them, without being obliged to resort to another book. The idea appears to me a useful one, and I will, therefore, close the present work by presenting a very brief account of such remedies as will prove servicable to the obstetrician. For a thorough description of the articles selected, and their uses in other departments of medical practice, the student is referred to the American Eclectic Dispensatory.

ACHILLEA MILLEFOLIUM.

YARROW.

This is an American perennial herb, which may be used in the form of infusion, tincture, or fluid-extract. It has been successfully employed in infusion, in diarrhea during pregnancy, and at the time of, or shortly after parturition. In menorrhagia, the saturated tincture in half fluidounce doses, repeated three or four times a day, has been found beneficial. The infusion has been used with advantage, as a vaginal injection in leucorrhea. The dose of the infusion is from four to six fluidounces three or four times a day, and any unpleasantness of flavor may be removed by the addition of a few drops of essence of Cinnamon.

The dose of the fluid-extract is one fluidrachm. The volatile oil, or its tincture, may likewise be used in doses of from ten to thirty drops, and its disagreeable taste may be concealed by a few drops of Oil of Anise, or Oil of Cinnamon.

ACIDUM GALLICUM.

GALLIC ACID.

This acid is generally prepared from Galls; it is a powerful astringent, effecting its influence without causing constipation. It has been given with benefit in menorrhagia, uterine hemorrhage, and chronic diarrhea. The dose is from five to ten or fifteen grains, three or four times a day. In irritable and painful conditions it may be advantageously combined with Opium.

ACIDUM TANNICUM.

TANNIC ACID.

Tannic acid is likewise prepared from Galls; it is a pure astringent, but occasions constipation. It will be found useful in diarrhea, and all passive discharges from the uterus; and as a local application in aphthous ulceration of the mouth, sore nipples, and prolapsus ani of infants. When used locally it may be employed in solution or ointment, in the proportion of five grains of the Acid to a fluidounce of Water, or to four scruples of Lard. Tannic acid is given in doses of from one grain to five.

ACONITUM NAPELLUS.

MONKSHOOD.

This is a European perennial herb, which may be used in several forms, but those of the saturated tincture of the root, and the alcoholic extract, are preferred. It should always be given in small doses; in large ones it acts as an energetic acro-narcotic poison. It exerts a remarkable influence over febrile and inflammatory affections, and has a decided tendency to relieve pain. Three parts of [illegible] of Gelseminum combined with one part of tincture of [illegible] ministered in doses of ten or twenty drops, ever [illegible] f required, will be found very beneficial.

desirable to overcome uterine irritability during parturition, check its powerful contractions, and lessen the pain. The same combination will likewise prove efficacious in the treatment of puerperal fever, and other febrile or inflammatory conditions during the parturient period. In painful dysmenorrhea, where large doses of tincture of Gelseminum have been required before relief was obtained, I have met with the most excellent results from its combination, as above, with the tincture of Aconite root; and in this distressing affection I would particularly invite the attention of practitioners to the remedy, as I consider it almost a specific. Neuralgia, or rheumatism of the uterus, may be removed by the same preparation; some practitioners administer from three to five grains of sulphate of Quinia in conjunction with the tincture, whenever there are marked symptoms of periodicity. Sometimes the substitution of the tincture of Cimicifuga, for that of the Gelseminum, will answer a much better purpose. Some females are subject to an annoying species of false pains, near the time of parturition, which frequently render them excessively impatient and irritable; these pains are not palliated by an alvine evacuation, but may be promptly removed by either of the above preparations. When Aconite is administered in poisonous doses, the stomach should be immediately and thoroughly evacuated, and stimulants employed both internally and externally. The dose of the tincture of the root is from three to ten drops in a teaspoonful of water; it is better to commence with the smaller dose, and gradually increase it. The extract may be given in doses of one-sixth of a grain two or three times a day, and gradually increased to half a grain, or a grain. I have used an extract prepared from the juice of the leaves, by Messrs. Tilden & Co., of New York, and prefer it to any article of foreign manufacture with which I have met.

ALETRIS FARINOSA.

UNICORN-ROOT.

A perennial herb, common to the United States, the root of which exerts a tonic or stimulating influence upon the reproductive organs of the female. In amenorrhea, dysmenorrhea, and engorged conditions of the uterus, it will be found of especial benefit, removing the difficulties by restoring the uterus to its normal energy, when a deficiency of this occasions the malady; it will also be found advantageous in those instances where there is an habitual tendency to abort, not depending upon syphilitic taint, or other causes independent of the condition of the reproductive organs. I have found it useful in prolapsus uteri, and am inclined to believe that it exerts a peculiar influence upon the uterine ligaments, having cured several severe cases of uterine prolapsus by this agent alone, without the aid of any mechanical means. In prolapsus I most usually combine it with equal parts of Pleurisy-root and black Cohosh, and which may be given in powder, or tincture, or medicated wine; or the concentrated preparations of these articles may be used.

The alcoholic extract, called *Aletridin*, may be used in affections of the uterus, with much advantage, its dose being one or two grains, to be repeated three or four times daily. Its combination with Asclepidin, Senecin, Caulophyllin, or Cimicifugin, will frequently be found useful. The dose of the root in powder is from five to ten grains, three or four times a day; of the saturated tincture, from five to twenty drops, in wine, or water.

ALOE SOCOTRINA.

ALOES.

There are several varieties of this article, the best among which is the Socotrine Aloes, derived from the leaves of the plant growing on the island of Socotra. It is most commonly used on account of its purgative or laxative properties; but, independent of this, it exerts an influence upon the uterus, either directly, or, by sympathetic extension of the intestinal irritability which it usually produces, and which has frequently been beneficial in amenorrhea. It is generally administered in the form known as tincture of Aloes and Myrrh, or *elixir proprietatis*, and which is prepared as follows:

℞. Powdered Aloes, three ounces,
Saffron, two ounces,
Tincture of Myrrh, two pints. Mix.

Macerate the mixture for fourteen days, and filter. The dose is one or two fluidrachms.

The following powder has proved efficacious in amenorrhea, depending principally upon a derangement or torpid condition of the uterine functions:

℞. [illegible] fifteen grains,
[illegible] scruples,
[illegible] scruple.

Mix, [illegible] one may be given for a dose.

A practitioner has furnished me with a formula for a pill, which he assures me, he has invariably found to restore menstruation in all cases of amenorrhea. It may be a very good pill for aught I know, but it contains too many articles, so that it is impossible to determine on which agent the benefit, if any there be, depends; or, whether it is a compatible mixture. I trust the time may speedily arrive, when such heterogeneous mixtures will be banished from our pharmacy, and when all classes of practitioners will trust more to the administration of simple medicines, and the determination of their therapeutical powers. I insert the formula as a matter of curiosity.

℞. Powdered Aloes,
Dried sulphate of Iron,
Powdered Myrrh, of each, half a drachm,
Cimicifugin,
Iodide of Potassium, of each, one scruple,
Oil of Savin, twenty drops,
Extract of Water-Pepper, a sufficient quantity to form the whole into a pill-mass. Mix.

Divide the mass into forty-eight pills, of which two are to be taken for a dose, and repeated three times a day.

Aloes is contra-indicated in inflammatory conditions, as gastritis, enteritis, peritonitis, etc., in irritable plethoric habits, in persons subject to piles, during pregnancy, and among females subject to sudden evacuations from the uterus. The dose of Aloes, is from five to twenty grains, and it is more generally administered in the form of pill.

ALTHÆA OFFICINALIS.

MARSHMALLOW.

A perennial herb common to several parts of Europe and this country. Its principal employment is as a diuretic, in the form of infusion, either alone, or in combination with some other diuretic, as Spearmint, Hair-Cap Moss, etc. It may be used in all febrile or inflammatory affections, plethoric conditions, and other difficulties where a mucilaginous diuretic is indicated. The *Hibiscus Palustris*, Marsh Hibiscus common to this country, has similar properties, and may be used as a substitute.

AMARANTHUS HYPOCHONDRIACUS.

AMARANTH.

A plant common to the Middle States, and known also by the name of *Red Cockscomb*. It possesses an astringent influence, and has been found of service in the diarrhea of parturient women, in menorrhagia, and as a local application in aphthous ulceration of the mouth. It is used in decoction, which may be taken freely.

AMMONIÆ HYDROCHLORAS.

CHLORO-HYDRATE OF AMMONIA.

Also known as *Muriate of Ammonia*, or *Sal-Ammoniac*. This salt is laxative, diuretic, diaphoretic, or refrigerant, according to the quantity and mode of administration; it is also considered a stimulating alterative, influencing the mucous, serous, and fibrous tissues. This property is owing to its solvent power, which it possesses in an uncommon degree, breaking down the tissues of the system more rapidly than mercury, and without any of its deleterious effects. In consequence of this action it will be found very beneficial in several chronic uterine affections. Induration of the uterus, engorgement, and ulceration of the cervix, have promptly yielded to its influence. It may be given in combination with Podyphyllin, Caulophyllin, Cimicifugin, Aletridrin, etc., according to indications.

The best mode of administering Muriate of Ammonia is in powder, or solution in syrup; the dose is from five to thirty grains, every three or four hours. As an injection in leucorrhea, engorgement, or excoriation of the cervix, it may be used in a solution containing about three or four drachms of the salt to a pint of rain-water. This is a remedial agent the beneficial influences of which are not sufficiently recognized by the profession.

ANTHEMIS NOBILIS.

CHAMOMILE.

This herb is a native of Europe, the flowers of which are the officinal portion. Chamomile [illegible] are tonic in small doses, and emetic in large. Independ [illegible] perties, however, they exert an emmenagogue influence [illegible] they are very useful in amenorrhea, and likewise in suspended lochia. They may be given in infusion, cold, one or two fluidounces every three or four hours; or, a saturated tincture may be exhibited in one or two fluidrachm doses, at the same intervals. After an abortion, it frequently happens that the uterus does not firmly contract, the cervix will be found soft, and the os uteri considerably open, with more or less discharge of a sanguineous character, in addition to which, the female will complain of great debility, and nervousness, being subject to attacks of hysteria; in such cases I have found prompt relief to follow the administration of a cold infusion of Chamomile flowers, in doses of two fluidounces, to be repeated three or four times a day, and to each dose of which were added twenty drops of Sulphuric Ether. The oil of Chamomile, in doses of from five to fifteen drops on Sugar, has afforded almost immediate relief in those instances of dysmenorrhea where the pain disappears on the appearance of the catamenia. The Messrs. Tilden & Co., of New York, prepare a superior fluid extract of this article.

APIUM PETROSELINUM.

PARSLEY.

A well-known plant, native of Europe, but extensively cultivated for culinary purposes. The root is diuretic, and may be used in retention of urine, scalding of urine, strangury, and whenever diuresis is desired; it is most commonly administered in infusion. The fresh leaves, when bruised, form an excellent application to swelled breasts, and are said to "dry up the milk" of wet nurses; they have been combined with the ointment on page 610, for this purpose.

APOCYNUM CANNABINUM.

INDIAN HEMP.

A plant common to this country, the root of which is officinal. It is a hydragogue-cathartic, and diuretic, and has been used in dropsy, and some febrile affections. A strong decoction of equal parts of Indian Hemp, and Pleurisy-root, given in fluidrachm doses, every one, two, or three hours, will be found exceedingly valuable in irritable and congested uterus, accompanied with nausea, vomiting, tympanitic abdomen, headache, and powerful pulsations of the abdominal aorta. Or, the fluid extracts of the two articles may be combined. The alcoholic extract of

Indian Hemp made by Tilden & Co., is deserving the attention of practitioners.

ARGENTI NITRAS.

NITRATE OF SILVER.

This salt is employed as a local application to ulcerations, granulations, and excoriations of the cervix, likewise to syphilitic eruptions or ulcers of the vagina, and in leucorrhea. The solid stick is used, or a solution varying in strength from five grains to eighty of the salt, to a fluidounce of distilled water. When the pain resulting from its application is excessive, it may be promptly relieved by washing the parts with a solution of common Salt, which, by decomposition, converts it into the insoluble Chloride of Silver. Recently, Mr. S. Wells has introduced the use of Nitrate of Silver in the solid form, diluted by a mixture of one, two, or three parts of Nitrate of Potassa; the two salts are melted together, poured into molds, and allowed to cool. By this means the caustic may be applied of any desired strength, and its effect be limited to the exact seat of morbid action.

ARISTOLOCHIA SERPENTARIA.

VIRGINIA SNAKEROOT.

This plant is common to the southern and central portions of the United States; the root is the officinal part, and is stated to have been efficacious, when exhibited in infusion, in amenorrhea. It is introduced here on account of the preparation, which is named the Compound Tincture of Virginia Snakeroot, and which is prepared as follows:

℞. Virginia Snakeroot,
Ipecacuanha,
Saffron,
Camphor,
Opium, of each, in powder, or bruised, two ounces,
Holland Gin, or,
Diluted Alcohol, six pints. Mix.

Macerate for fourteen days, express, and filter through

This preparation is a powerful sudorific, and will be fo
all cases where it [illegible] oduce copious perspir
allay nervous exc [illegible] sleep, and pr

to the skin. In painful dysmenorrhea, amenorrhea from recent exposure to cold, after-pains, etc., it will be found exceedingly beneficial. The dose is from ten to sixty drops every hour or two, in some warm infusion of Catnip, Sage, or Balm, etc.

ARNICA MONTANA.

LEOPARDSBANE.

A plant common to the mountainous districts of Europe and Siberia. I have recently employed the flowers of this plant in congestion of the cervix, and ecchymosis of the cervix, or that condition which when viewed through the speculum, appears of a dark-reddish color, leading the practitioner to suspect erosion or ulceration, either of which, however, will be found absent on a careful examination. The flowers, after having been steeped in hot water, are to be applied directly to the cervix. This I most usually accomplish by rolling up a piece of muslin or linen five or six inches in width, until it forms a roll about an inch and a half in diameter; one end of this is pressed downward, so as to form a cup-like concavity, in which the Arnica poultice is placed, and then introduced within the vagina to the cervix, the female standing during its introduction. The roll is kept in its place by means of a bandage. While wearing this, the patient must exercise as little as possible. A soft extract may, for the same purpose, be applied to the cervix through the speculum, and then covered with lint. These applications will not be required oftener than twice in the course of twenty-four hours. Muriate of Ammonia should be given internally with such other agents as may be suited to the peculiarity of each individual case.

ASCLEPIAS TUBEROSA.

PLEURISY-ROOT.

A well-known plant common to this country, the root of which possesses diaphoretic and expectorant properties. It likewise exerts an influence upon the uterus and its ligaments. It may be used in leucorrhea and prolapsus uteri, alone, or combined with Unicorn-root, Black Cohosh, Blue Cohosh, Life-root, or Red-root. My usual mode of exhibiting it is already explained under the head of Aletris Farinosa, which see. *Asclepidin*, its concentrated preparation, may be administered with Senecin, Caulophyllin, Cimicifugin, etc., in many uterine maladies with beneficial results. A very good pill for prolapsus uteri, and indeed for several derangements of the uterine functions, is made as follows:

℞. Asclepidin,
Aletridin,
Hydro-alcoholic extract of black Cohosh,
of each, ten grains. Mix.

Divide into ten pills, of which three or four may be taken daily. The hydro-alcoholic extract of Pleurisy-root will also be found an elegant preparation in uterine displacements: its dose is from three to ten grains three times a day. The dose of Pleurisy-root, in powder, is from twenty to sixty grains; of the infusion, from two to four fluidounces, every two or three hours; of the Asclepidin, from one to five grains.

ASSAFŒTIDA.

ASSAFŒTIDA.

This is the gum-resin or concrete juice of the Ferula Assafœtida, a plant indigenous to Persia. It is considered stimulant, antispasmodic, and emmenagogue, and is used in hysteria, spasmodic nervous diseases of females, and occasionally in amenorrhea and dysmenorrhea. It should not be used in inflammatory conditions of the system. A very excellent preparation for the sick or nervous headache to which many females are subject, is composed as follows:

℞. Powdered Assafœtida, thirty-two grains,
Sulphate of Quinia, eight grains,
Sulphate of Morphia, one grain,
Piperine, sixteen grains. Mix.

Divide into eight powders, of which three may be taken daily. I do not know the benefit to be obtained from the Piperine, and think it might advantageously be omitted.

Assafœtida may be combined with Caulophyllin and Cimicifugin, for nervous derangements depending upon uterine difficulties. The dose of the gum-resin is from five to ten grains; of the tincture, from half a fluidrachm to two fluidrachms. The tincture, diluted with some bitter decoction and injected into the rectum, will remove the thread-worm, *ascarides*, to which children are liable.

ATROPA BELLADONNA.

BELLADONNA.

A European plant, and an energetic narcotic poison. It is principally employed in the form of tincture, or alcoholic extract. Belladonna is anodyne, antispasmodic, and calmative, and is much used in uterine difficulties, especially in dysmenorrhea. The following pill has proved very efficacious in the treatment of dysmenorrhea:

℞. Camphor, two and a half drachms,
Sulphate of Quinia,
Extract of Belladonna,
Wheat Flour, of each, one scruple,
Water, a sufficient quantity to form a pill-mass. Mix.

Divide the mass into eighty pills. The dose is two pills every hour, at the menstrual period, until the pain ceases, and one pill every three or four hours during the interval. The flour is merely added for the purpose of aiding in making a pill-mass. The same pills will be found useful in neuralgia, and rheumatism of the uterus, and to restore the nervous system to its normal activity, after a recovery from puerperal convulsions.

In rigidity of the os uteri during labor, it has been recommended to overcome this condition by anointing the cervix with the extract of Belladonna.

In neuralgia of the uterus, it has been advised to mix together one grain and a half of extract of Belladonna, and three-fourths of a grain of Opium. Place the mixture in the center of a small pledget of carded cotton, fold it up, and tie it with a strong thread, leaving long ends to the thread so that the whole can be easily removed. This pledget is to be introduced into the vagina and placed upon the cervix, where it may remain for twelve or twenty-four hours.

Dysmenorrhea, Leucorrhea, and Chorea, may be frequently cured by the following pill:

℞. Extract of Belladonna, three grains,
Strychnia, one grain,
Hydro-alcoholic extract of Cimicifuga, two scruples. Mix.

Divide into forty pills, of which one is a dose, to be repeated three or four times daily.

The dose of the tincture of Belladonna is from five to thirty drops; of the extract, from one-sixteenth of a grain to half a grain. The best extract I am acquainted with, is that made by Messrs. Tilden & Co.

BAPTISIA TINCTORIA.

WILD INDIGO.

This is a small shrub indigenous to various parts of the United States, the root of which possesses antiseptic properties. Its principal employment in obstetrics is in irritative fever from putrefactive absorption, where it may be exhibited with much advantage. I have derived much benefit in such cases from an infusion of two ounces each of Blue Cohosh root and Unicorn root, and one of Wild Indigo root, in three pints of water: of this the dose is a tablespoonful every two, three, or four hours, as the circumstances of the case may demand.

BAPTISIN, the concentrated preparation from the root, in doses of from one-fourth to one half a grain, exerts a marked influence on the glandular and nervous systems, producing, if carried too far, a disagreeable sensation with prostration. Yet, in combination with Leptandrin, Quinia, Podophyllin, Cimicifugin, etc., it will be found valuable in many uterine diseases, in typhoid fever, in the typhoid form of puerperal fever, and in all diseases of a typhoid character. It also forms an excellent local application to malignant and fetid ulcerations of the cervix uteri, for which purpose it may be used alone, or combined with Sanguinaria, vegetable Caustic, Nitrate of Silver, etc. This plant does not receive that attention from the profession which its virtues entitle it to.

BIDENS BIPINNATA.

SPANISH NEEDLES.

This plant is common to this country: the seeds are emmenagogue, and have been beneficially used in infusion and in tincture in amenorrhea, dysmenorrhea, and other uterine derangements. The dose of the infusion is from two to four fluidounces three or four times a day; of the tincture, one or two fluidrachms.

CALX.

LIME.

This article is introduced here for the purpose of giving the formula for Potassa cum Calce, also known as *Vienna powder*, or *paste*, a powerful caustic, used for cauterizing the neck of the uterus or other parts. It is prepared by reducing caustic Potassa one ounce and a half, and quicklime two ounces, each separately, to powder in a heated mortar; they are then to be carefully and rapidly mixed, and the mixture kept in a wide-mouthed bottle with a ground stopper. In using this caustic, moisten the powder with a little alcohol, so as to reduce it to a soft paste, and apply it only over the part to be cauterized. The *Caustic of Filhos* is more easy to use, and is made by fusing together six ounces of caustic Potassa and three ounces of Quicklime, pouring the mixture into leaden cylinders inclosed in glass tubes, and which are to be sealed subsequently at each end.

CAMPHORA.

CAMPHOR.

A concrete substance derived from Laurus Camphora, a tree indigenous to Asia. It possesses sedative, anodyne, and antispasmodic properties, and is administered to subdue pain, allay nervous excitement, arrest spasm, and, in combination with Opium, Lupulin, or Hyoscyamus, etc., to cause sleep. It has been found highly beneficial in all irritations of the generative organs, and has been exhibited in neuralgia of the uterus, dysmenorrhea, after-pains, nymphomania, puerperal fever, etc. It enters into the officinal compound powder of Ipecacuanha and Opium, and the compound tincture of Virginia Snakeroot. The following pill forms an excellent remedy for those females who are subject to excessive nervous irritability:

℞. Powdered Camphor, four scruples,
Powdered Opium, two drachms,
Valerianate of Quinia, half a drachm,
Extract of Stramonium, a sufficient
quantity to form a pill-mass. Mix.

Divide the mass into ninety-six pills, of which one is to be given every night and morning, gradually increasing the dose.

The dose of Camphor in Powder is from one to five grains; of the tincture, from five to sixty drops, in mucilage or syrup.

CAPSICUM ANNUUM.

CAYENNE PEPPER.

Cayenne Pepper is a pure stimulant, of much service in dyspepsia, torpor of the gastric functions, colds, catarrh, hoarseness, and in all cases of diminished vital action wherever a pure stimulant is indicated. It is also found to be of benefit in passive hemorrhages, and especially uterine hemorrhage occurring at the period of parturition. The following preparations have been successfully used in menorrhagia and uterine hemorrhage:

1. ℞. Cayenne Pepper, two scruples,
Opium, four grains,
Ipecacuanha, eight grains. Mix.

Divide into eight powders: the dose is one powder every fifteen, twenty, or thirty minutes, as the urgency of the case may require.

2. ℞. Calcined Deer's Horn,
Comp. powd. of Ipecacuanha and Opium,
Cayenne Pepper, of each, one drachm. Mix.

The dose of this is from one to four or six grains, every 20, 30, or 60 minutes.

3. ℞. Powdered sulphate of Iron, two drachms,
Powdered Alum, one drachm. Mix.

Calcine by a red heat, and, when cold, pulverize, and add to every drachm of the mixture, one scruple of Cayenne Pepper. Keep the mixture in well-stopped bottles. The dose is from four to six grains, as with the preceding powders.

Capsicum is a prominent ingredient in the compound tincture of Lobelia and Capsicum—a most useful preparation to relax muscular rigidity, and overcome spasmodic action. The dose of capsicum, in powder, is from one to six grains; of the tincture, from half a fluidrachm to a fluidrachm.

CAULOPHYLLUM THALICTROIDES.

BLUE COHOSH.

This is a perennial plant, found in nearly all parts of the United States, the root of which possesses emmenagogue, parturient, and antispasmodic properties. It has been found efficacious as an internal remedy in leucorrhea, amenorrhea, dysmenorrhea, and other chronic affections of the uterus. In neuralgia and rheumatism of the uterus it has frequently been administered with benefit. The decoction used for several weeks previous to parturition, is said to impart an energy to the uterus, which facilitates delivery; in which respect it acts as a preparatory parturient; for this purpose it is sometimes combined with the *Mitchella repens*, and *Eupatoria aromatica*. A preparation, called the *Parturient Balsam*, is quite a favorite agent with many practitioners for this purpose, as well as for giving tone and activity to the uterus when its functions are torpid or impaired, as in amenorrhea, dysmenorrhea, leucorrhea, etc.; it is prepared as follows:

℞. Blue Cohosh root,
Spikenard root, of each, four ounces,
Black Cohosh root,
Partridgeberry herb,
Queen-of-the-Meadow root, of each, two ounces,
Ladies-slipper root,
Comfrey root, of each, one ounce. Mix.

Grind and mix the articles together, place them in a convenient vessel, cover them with Alcohol of 76 per cent., and macerate for two days. Then transfer the whole to a displacement apparatus, and gradually add hot Water, until half a pint of the tincture has been obtained, which retain and set aside. Continue the percolation until the solution obtained is almost tasteless, preserving that which contains a sensible amount of Spirit, from the subsequent solution. Boil down this weaker infusion until, when added to the second portion obtained, it will make three pints. To these two solutions combined, add of refined Sugar four pounds, and dissolve it by heat, carefully removing the scum which arises as it comes to the point of boiling, and evaporating, if necessary, so that there will be half a gallon of syrup, when the half pint of tincture, first obtained, is added—which is to be done after the syrup has been removed from the fire, and is nearly cold. The preparation is be flavored with any pleasant aromatic, as essence of Wintergreen, Sassafras, etc.

The dose of this compound is from a teaspoonful to a tablespoonful, three or four times a day.

Given in powder or decoction, Blue Cohosh will frequently be found more desirable than Ergot, for expediting delivery, in all those cases where the delay is owing to fatigue, debility, or want of uterine energy; the contractions it occasions, more nearly resemble the natural ones, instead of the continuous, spasmodic contractions effected by ergot. It is sometimes combined with Black Cohosh for this purpose, and some accoucheurs prefer a combination of equal parts of Blue Cohosh, Black Cohosh, and Ergot. The compound tincture of Blue Cohosh is frequently employed in amenorrhea, dysmenorrhea, and other uterine affections, with much benefit; it is prepared as follows:

℞. Powdered Blue Cohosh root, two ounces,
Ergot,
Water Pepper, of each, bruised, one ounce,
Oil of Savin, half a fluidounce,
Alcohol, one pint and a half. Mix.

Macerate for fourteen days, express, and filter; or, it may be made by displacement. The dose is a fluidrachm, two or three times a day.

As a local application, and also administered internally, the infusion of Blue Cohosh stands unrivaled in aphthous ulcerations of the mouth common to children; it is usually mixed with an equal quantity of Golden Seal, made into an infusion, and sweetened with Honey.

The infusion is made by adding an ounce of the powdered root to a pint of boiling water, and allowing it to macerate for fifteen or twenty minutes; the dose is from two to four fluidounces three or four times a day; or, to promote uterine contractions, every fifteen or twenty minutes. The dose of the saturated tincture is from half a fluidrachm to two fluidrachms. The Hydro-alcoholic extract of Blue Cohosh, forms an elegant preparation for amenorrhea, dysmenorrhea, and other uterine diseases; it may be used alone, or in combination with Senecin, Aletridin, Cimicifugin, or extract of High-Cranberry bark. It will likewise be found serviceable in after-pains. An excellent pill for painful affections of the uterus, is made as follows:

℞. Hydro-alcoholic extract of Blue Cohosh,
Hydro-alcoholic extract of High-Cranberry bark, of each, one drachm,
Scutellarin, two drachms. Mix.

Divide into sixty pills, of which one pill may be given every two, three, or four hours. This pill will also be found advantageous, both during pregnancy, and labor, in cases where there is excessive nervous irritability, restlessness, wakefulness, cramps of the stomach, or other spasmodic attacks.

The dose of the Hydro-alcoholic extract of Blue Cohosh is, from one to five grains, three times a day.

CAULOPHYLLIN, is the name given to the concentrated preparation obtained from the root of Blue Cohosh; it possesses the properties of the root in an augmented degree, and is at present more generally used. In amenorrhea, dysmenorrhea, leucorrhea, passive menorrhagia, congestion of the cervix, etc., it has proved very efficacious, and, in which it may be used alone, or combined with other agents known to exert an influence on the uterus, and which have been referred to above. It exerts a very decidedly beneficial influence in severe after-pains, and will be found of much value, after delivery, in cases where the uterus is not disposed to contract firmly. Where there has been a tendency to hemorrhage from relaxation of the muscular fibers of the uterus, after delivery, I have caused firm contractions by the exhibition of a powder composed of two grains of Caulophyllin, and one of Capsicum, repeating the dose every fifteen or twenty minutes, or, every hour.

In lingering labor occasioned by inefficient contractions of the womb, Caulophyllin may be given in doses of from two to four grains, repeated at intervals of fifteen, thirty, or sixty minutes; in the course of an hour or an hour and a half, it will most usually arouse the organ to energetic action. The following pill will be found very efficacious in all uterine difficulties depending upon a torpid condition of the organ, as in amenorrhea, dysmenorrhea, etc.:

℞. Caulophyllin, one scruple,
Podophyllin, one grain and a half,
Alcoholic Extract of Nux Vomica, one grain,
Extract of Water Pepper, a sufficient quantity to form a pill-mass. Mix.

Divide into ten pills, of which one may be given for a dose, and repeated three times a day.

In one case of inefficient contractions of the uterus, I administered two grains of Caulophyllin made into a pill with an equal quantity of the extract of the recent inner bark of the Cotton root; the second dose was repeated after an interval of half an hour, and was promptly followed by powerful action of the organ, speedily terminating the labor, and without any unpleasant results.

The usual dose of Caulophyllin is from one-fourth of a grain to a grain, repeated two, three, or four times a day.

CEANOTHUS AMERICANUS.

RED ROOT.

An indigenous plant, possessing astringent properties. A strong decoction of the root has been employed with success in passive menorrhagia, in diarrhea of puerperal women, and as a local application to aphthous ulcerations of the mouth and throat of children, as well as in ulceration of the fauces attendant on scarlatina. It has also been usefully employed as an injection in vaginal leucorrhea. The dose of the decoction is from half a fluidounce to a fluidounce three or four times a day. It is a valuable agent, not properly appreciated by the profession.

CEPHAËLIS IPECACUANHA.

IPECACUANHA.

A South American plant, the root of which possesses nauseant, emetic, tonic, stimulant, and diaphoretic properties. It is much employed in febrile, inflammatory, painful, and irritable forms of disease, and, usually, combined with Opium and Camphor, as in the compound powder of Ipecacuanha and Opium.

In diarrhea and dysentery, Ipecacuanha, administered in small doses, has been regarded as a valuable remedy; when much pain is present, sulphate of Morphia may be added to each dose; say one-eighth of a grain of Morphia, to two or three grains of Ipecacuanha. If the dysentery is epidemic, the addition of sulphate of Quinia to each dose, say from half a grain to a grain, will improve the action of the remedy. A combination of Leptandrin, one grain, Podophyllin, one-fourth of a grain, Ipecacuanha, one grain, sulphate of Quinia, half a grain, has been successfully administered in epidemic dysentery; the above dose to be repeated every three or four hours.

Ipecacuanha, in doses of five or ten grains, has been found very useful in menorrhagia; and [illegible] and Capsicum, it promptly checks uterine hemorrhage. It enters into the compound tincture of Virginia Snakeroot, a preparation which frequently proves beneficial in puerperal peritonitis. See page 643. The dose of Ipecacuanha as an emetic, is from twenty to thirty grains; as a nauseant, from five to ten grains; as a tonic, from one-fourth to one-half of a grain; as a stimulant and diaphoretic, from half a grain to two grains, every three or four hours.

CHLOROFORMUM.

CHLOROFORM.

This article is a sedative-narcotic, and has been employed internally in various forms of disease, for the relief of pain and nervous irritability. The following preparation has been recommended in cases of excessive nervousness, and where spasmodic action exists:

℞. Camphor Water,
Tincture of Valerian, of each, two fluidounces,
Chloroform, one fluidounce. Mix.

The dose is half a fluidounce every hour or two, or as often as the urgency of the symptoms require.

Applied to the os uteri, by means of a sponge, Chloroform has proved successful in dysmenorrhea.

But it is principally on account of its anæsthetic influence that this article is employed in surgery, and also in midwifery, for the purpose of relieving pain, and facilitating labor. With regard to its employment during parturition, there is some discordance of views among the members of the profession, the major part of whom, I believe, are rather favorable to its use. That it may be of service in puerperal convulsions, or when turning has to be employed, or in severe and difficult operations, can not be denied; but there is considerable danger from its use, even in these cases. For instance, when the female lies in a state of anæsthetic unconsciousness, unable to give vent to her expressions, or to warn the operator that he may be doing some mischief, how is he positively to determine that he is not lacerating the vagina, or cervix, or that a rupture of the uterus has taken place? If the operator is not experienced in using the forceps, he may include the cervix in its grasp, and not be aware of the mistake until it is too late to be remedied. True, these accidents have seldom occurred when Chloroform has been used, but there is a liability to their occurrence, and one death resulting from this cause, which would not, probably, have happened, without the use of Chloroform, should be sufficient to render the practitioner very cautious in its administration, and also in his mode of operation. Undoubtedly, every accoucheur should be prepared to operate safely under all circumstances, but when even the most experienced and skillful fail occasionally, how much greater must be the risk when the operator is careless, inattentive, or ignorant, to one of which imputations, too many, alas, of our practitioners are justly obnoxious.

But, Chloroform is also recommended in ordinary labors, for the purpose of alleviating the sufferings of the female, and when thus used, its full anæsthetic influence is not usually produced. The motive is, undoubtedly, humane, but the propriety of thus employing it has been doubted, because, even when under its moderate influence, hemorrhage, or some other difficulty, may occur, which, by not being timely observed, may prove troublesome or serious; and I have witnessed cases in which I have every reason to believe, that the labors were rendered tedious by the use of the Chloroform.

These may be said to be the principal objections against the use of Chloroform in midwifery, and should be duly considered by every medical man, without partiality or prejudice. That the agent may be, and has been employed with immense benefit, there is not the least doubt, and, notwithstanding the above objections, the weight of testimony is in its favor. The only questions to determine are, under what circumstances to exhibit it, at what period, and to how great an extent.

As to the circumstances under which it may be used, general rules are all that can be given. It is well known that there is a great difference among females as to the amount and intensity of suffering experienced during parturition; some passing through this period rapidly, and with, comparatively, little pain, while with others the suffering is intense, whatever may be the duration of the labor. The former do not require Chloroform, nor any other anesthetic, but, when the latter are brought partially under its influence, much agony may be prevented, and the system preserved from the influence of a too powerful nervous shock. Chloroform may also be used in cases of turning, more especially when the uterus is very irritable, contracting energetically upon [illegible] se the hand within its cavity; likewise
d in craniotomy; and the operator
the possibility of some accident
een presented as objections to
ially those which are long

and painful, the efforts of the operator are frequently embarrassed by the resistance of the female, and there will be as much danger of injury to the soft parts, if not more, than when she lies in a state of anæsthetic passiveness. Chloroform should be used with a degree of hesitation and extreme caution in craniotomy, where sharp instruments are introduced within the female organs, because a careless thrust, an error of motion, or a slipping of the crotchet, may produce irreparable mischief. There is greater hazard to the female in this operation, than when the agent is used in turning, or during a forceps operation. Still, in careful and prudent hands, anæsthesia may be produced in craniotomy, without any of the above-named evil results being effected.

As to the period for its exhibition and the extent to which anæsthesia should be carried, much must be left to the judgment of the well informed and prudent accoucheur. I think it were better not to allow too great a degree of prostration to ensue previous to its inhalation; and, that there is no necessity for the production of complete unconsciousness, except in convulsions, and the more severe operations.

Perhaps the more pertinent question with regard to this agent in midwifery would be, not to determine when it should be used, but, when shall its exhibition be omitted? This question is not yet positively settled, but enough has been gleaned to lead us to be cautious in exhibiting it to females laboring under diseases of the lungs or heart, those of a plethoric habit, or disposed to congestion of some of the more important organs, as well as to those who are in a state of great exhaustion.

Anæsthesia may frequently be produced with advantage in cases where it is desired to reduce a displaced uterus, where the cervix is to be cauterized, where dysmenorrhea is treated by mechanical means, as well as in other operations upon the cervix, or vagina.

Dr. S. L. Hardy, has successfully employed Chloroform, in vapor, as a local application, in all painful uterine diseases. "The application for applying it consists of a small metallic chamber; to one end of this a gum-elastic bottle is attached, to the other a pipe furnished with a valve. On the end of the chamber there is also a second valve, to admit atmospheric air for the working of the instrument. In order to charge it with Chloroform it is necessary to unscrew the stopper in the side of the chamber, within which a piece of sponge is placed for holding the fluid. The quantity poured in should not be more than the sponge will absorb, otherwise, instead of vapor, fluid Chloroform will be thrown against the affected part. When charged the vapor may be conveyed to any part requiring its application by any convenient pipe if closely fitted to the one on the instrument, pressure being made on the elastic bag to produce expulsion of the vapor.

"The first effect produced by its application is a sensation of heat, which some complain of more than others, but which in a very few minutes is not referred to, as it is either more easily borne or soon subsides. If much uneasiness is expressed on account of it, the action of the instrument may be suspended for a little, or its effect diminished, which is all that is necessary. When applied per vaginam, on account of pain in the loins, and sometimes over the pubes, arising from uterine irritation, immediately after the sensation of heat is felt from the presence of the vapor, the pain subsides, first in the back, then in the pubic region.

"I have met with but one case in which chloroform, applied in this manner, did not remove pain; but in this instance the uneasy sensations were confined to the uterus, or felt per vaginam, and at the same time the os uteri was very irritable on account of excoriation, which might account for a greater degree of heat than usual being experienced.

"The relief afforded by the local application of the vapor of chloroform is not of a very transient nature. In every instance in which pain was removed by it there was no return for several hours, and then in a very mitigated degree. In the intervals great comfort was usually felt. Patients who had previously taken opium, preferred chloroform, as it caused no unpleasant sensations in the head the next day."

This gentleman occasionally applies an ointment, rubbing it over the loins, or other painful part, in conjunction; it is made by mixing a fluidrachm of Chloroform, and a scruple of Camphor, with an ounce of White Wax ointment, to which, occasionally, a drachm of the extract of Bel[illegible]nna may be added.

He has successfully employed the vapor douche of Chloroform in dysmenorrhea, carcinoma of the uterus, irritable nipples, pruritus pudendi, etc.

The usual mode of exhibiting Chloroform, by inhalation, is, to closely roll a handkerchief in the hand, making a concavity in it, in which about a fluidrachm of the article is to be poured; this is to be held to the nose and mouth, but not so closely as to prevent the inhalation of atmospheric air with it. Every four or five minutes a fresh supply of Chloroform, but in smaller quantity, may be added, and [illegible] the desired influence is effected, which usually takes p[illegible] to five minutes. As the anæsthetic influence passes [illegible] minutes, it will be required to renew the inhalation [illegible] so as to keep up the incomplete or complete insensibility for any desired length of time.

The Chloroform used must be pure, or it will produce disagreeable, and perhaps serious results; and whenever any unfavorable symptoms arise from its inhalation, Aqua Ammonia, which should always be held in readiness, must be poured upon another handkerchief, and the patient made to inhale it instead of the Chloroform. This will usually restore sensibility, but should it fail, cold water must be applied to the head and face, which parts should be constantly fanned; the body and extremities should be warmed and rubbed; Galvanism may be applied, and if necessary, artificial respiration.

" Mr. R. E. Bickerstcth of Liverpool, after much careful investigation, comes to the following important conclusions on the mode of death from Chloroform:

1st. That in death from the inhalation of chloroform, the respiratory movements cease before the cardiac.

2d. That the heart continues its action, uninfluenced by the chloroform, for a period longer or shorter after the cessation of respiration, and that its then failing may be considered as a natural consequence of the respiration having ceased, and as independent of the influence of chloroform.

3d. That if after the respiration has ceased, and while the heart is still in action, chloroform continues to be absorbed into the system, its movements may become impaired or cease—the chloroform in such case acting directly upon the heart.

4th. That if artificial respiration be resorted to before the cardiac contractions are seriously affected, and be properly maintained for a sufficient period, the respiratory functions may be re-established."

He adds the following highly practical observations:

" I would here direct attention to the expediency of drawing forward the tongue, in all cases where it is found necessary to resort to artificial respiration. When the patient is lying on the back, so soon as the breathing ceases and the jaw drops, the tongue is particularly liable to fall backward and close the orifice of the glottis. Artificial respiration, under such circumstances, is worse than useless. It is better at once to pull the tongue well out of the mouth, and passing a hook through the tip, confide it to the care of an assistant. I am convinced that in some cases in which artificial respiration has failed, it has been from the neglect or too tardy adoption of this very simple means. Time of the utmost value has been lost in the absurd attempt to restore animation, by applying stimulants to the nostrils, or pouring cordials into the mouth, without even a thought that the first can have little or no effect after the respiration has ceased, or that the second would as likely pass into the trachea and bronchi as into the stomach."—*Edinburg Monthly Journal.*

The following communication is from one of my colleagues:

PROF. J. KING, M. D.:

Dear Sir—You are pleased to ask my opinion of Chloroform in Obstetrical practice.

When chloroform was first introduced into use in America, I was called to attend a woman with typhoid fever, who had been pregnant some six months. After a sickness of two weeks, her child died, and decomposition commenced, without any expulsive effort, or expulsive power on the part of the mother. I placed her under the influence of chloroform, and in four hours succeeded in removing the child.

During all this time she was sufficiently under the anæsthetic influence of the agent, as to be free from suffering, and with no unfavorable symptoms; she recovered rapidly.

Shortly after, I attended a patient whose child was born, previous to my arrival, in the hands of a midwife, and I found her laboring under puerperal convulsions of an aggravated character. I tried several articles without benefit, until she inhaled chloroform, which immediately relieved her, and by frequent repetitions, it entirely removed them.

These two cases impressed me so favorably, that since, I have never willingly attended a case of parturition without having chloroform at my command, and I have very often administered it, when my object was simply to relieve the patient of pain. I have also used it preparatory to turning, the application of forceps, the removal of the placenta, and the introduction of the hand into the uterus to induce that organ to contract, and I have never yet had cause to regret its use in any case. I *have*, however, regretted that the prejudices of my patients have sometimes precluded its use, as I think, greatly to the increase of their sufferings, and the loss of my patience and my time.

In short, I have come to consider chloroform as great a boon in the practice of Obstetrics as in the practice of any other departme surgery.

Yours, etc.,

C. H. CLEAV

CINCINNATI, *July* 19, 1855.

Those who desire more minute information relative t referred to the excellent papers, by Channing, Simps

Clarke, etc., as well as to the Report of the Committee on Obstetrics to the American Medical Association for 1849.

CIMICIFUGA RACEMOSA.

BLACK COHOSH.

This perennial plant, also known as *Macrotys Racemosa*, is indigenous to the United States, and is a very active and useful remedy. The root is the officinal part. It possesses a peculiar influence upon the uterine system, as well as upon the nervous system generally. Administered internally it is very efficacious in amenorrhea, dysmenorrhea, leucorrhea, and other uterine affections, in which it may be used alone, or in combination with other agents, as Asclepias, Aletris, Caulophyllum, Senecio, etc. The saturated tincture, in combination with the saturated tincture of Aconite, or the tincture of Gelseminum, forms a highly valuable preparation for rheumatism of the uterus, neuralgia of the uterus, and the febrile or inflammatory affections which occur at the parturient period. Combined with the tincture of Colchicum seed, it is beneficial in acute rheumatism, and in phlegmasia dolens; for these purposes it has been used in the following form:

℞. Saturated tincture of Black Cohosh,
Tincture of Colchicum seed,
Tincture of Iodide of Potassium, of each, one fluidounce.
Mix.

The dose is a fluidrachm, every two, three, or four hours, as symptoms may indicate.

It may be used as a partus accelerator, a decoction of the root being exhibited. It does not produce the powerful and continuous contractions of the uterus which follow the use of Ergot, and consequently is not so dangerous to the child, neither does it lessen the susceptibility of the organ to subsequent doses, as is apt to be the case with Ergot; it appears to excite the uterus to a normal activity only. As a partus accelerator, half a drachm of the powdered root, in some hot water, or half a fluidrachm of the saturated tincture, may be given for a dose, and repeated every fifteen or twenty minutes until the expulsive action of the uterus is induced. It is sometimes given for this purpose in combination with Blue Cohosh, etc.

After-pains will be relieved by it, as well as the state of general excitement of the nervous system following delivery.

I prefer the saturated tincture of the root, or its hydro-alcoholic extract, either of which I consider superior to the concentrated preparation, Cimicifugin.

In leucorrhea, prolapsus uteri, relaxation of the vaginal walls, and excoriation of the cervix, the following vaginal injection will prove advantageous:

℞. Powdered Black Cohosh root,
Powdered Cranesbill root, of each two ounces,
Boiling Water, four pints. Mix.

Cover the articles, digest for an hour or two, and strain. About two fluidounces may be injected at a time, and which should be repeated three or four times a day.

The dose of the powdered root, is from a scruple to a drachm, repeated three or four times daily; of the saturated tincture, from five to sixty drops; of the infusion, from two to four fluidounces. It will be found to exert a powerful influence on some patients, even when given in very small doses, while with others the maximum dose exerts no appreciable effect. The fluid extract of Black Cohosh, may be used in all cases where the article is indicated; its dose is from half a fluidrachm to two fluidrachms. The Messrs. Tilden & Co., of New York, prepare a superior fluid extract, to which I would call the attention of the profession.

CIMICIFUGIN (or *Macrotin*), is the name given to the concentrated preparation obtained from the root of Black Cohosh; it is much used by practitioners as a substitute for the crude article, but I do not consider it to possess all the medicinal virtues of the root, though it is undoubtedly a valuable remedy in uterine affections, in which it may be advantageously combined with Aletridin, Caulophyllin, Asclepidin, Senecin, etc. Leucorrhea, menorrhagia, amenorrhea, dysmenorrhea, prolapsus uteri etc., have been decidedly benefited by its administration. As a parturient I deem it inferior to Caulophyllin. The dose is from half a grain to six grains, three times a day.

Mr. E. Wayne, of Cincinnati, one of our most thorough chemists, has made a preparation from the tincture of the root, which possesses all its medicinal virtues in a concentrated form. The saturated tincture of the root is allowed to evaporate spontaneously, when there is deposited a solid mass; the remaining fluid is poured from this, the mass is dis- [illegible] ohol, slowly evaporated to the consistence of a fluid extract, and is then placed in thin layers on glass and allowed to dry. The preparation has the peculiar smell and taste of the root, and, as far as tried, appears to be superior to any other preparation of the article. About one ounce is obtained from two pounds of the root, and which can well be afforded for one dollar and fifty cents. It should not be washed in water, as this removes some of its medical properties. I have no doubt but that this preparation will supersede the use of our present Cimicifugin. The little experience I have had with it, leads me to consider it at least equal, if not superior, to the hydro-alcoholic extract, or the saturated tincture of the root.

CINNAMOMUM ZEYLANICUM.

CINNAMON.

This tree is a native of Ceylon, Sumatra, Borneo, etc., the bark of which furnishes the Cinnamon of commerce. Cinnamon exerts an influence upon the uterus, independent of any astringency, which not only renders it useful in uterine hemorrhage and menorrhagia, but disposes the pregnant female to a miscarriage. Indeed, Cinnamon and Borax, mixed together in the proportion of ten grains each, have been administered with the criminal intention of procuring an abortion. It is, however, only in uterine hemorrhage in which this agent is advised, and it may be exhibited either in the form of tincture of the bark, or the essence: or either of these may be combined with other astringents, as tincture of Rhatany, spirits of Turpentine, tincture of Kino, etc. The dose of the tincture, or of the essence, is from half a fluidrachm to a fluidrachm, in a wineglass of sweetened water; to be repeated every ten, fifteen, or thirty minutes, according to the severity of the flooding. In hemorrhage with much prostration, the following preparation has been administered with success:

℞. Tincture of Cinnamon,
Tincture of Rhatany,
Tincture of Ergot, of each, one fluidrachm,
Port Wine, three fluidounces. Mix.

The dose is a fluidounce, as often as required.

COFFEA ARABICA.

COFFEE.

Green Coffee, powdered, and made into a strong decoction, will be found a superior remedy in amenorrhea, where symptoms of the menstrual struggle are present, as manifested by fullness of the head, and pains of the back and loins. Its use should be preceded by a mild purgative, and aided by the warm foot-bath; the dose of the decoction is a wineglassful every half hour or hour.

CONVALLARIA MULTIFLORA.

SOLOMON'S SEAL.

An indigenous, perennial plant, the root of which has been found of considerable value in leucorrhea, menorrhagia, and female debility. It is most commonly used in the form of compound wine of Comfrey, known as the *Restorative Wine Bitters*, and which is prepared as follows:

℞. Solomon's Seal Root,
Comfrey-root,
Spikenard-root, of each, bruised, one ounce,
Chamomile Flowers,
Colombo-root,
Gentian-root, of each, bruised, half an ounce.

Place the herbs in a vessel, cover with boiling water, and let the compound macerate for twenty-four hours, keeping it closely covered; then add Sherry Wine four pints, macerate for fourteen days, express, and filter.

The dose is from a tablespoonful to a wineglassful three or four times a day; and it forms a most valuable tonic in all diseases peculiar to females.

Solomon's Seal exerts a beneficial influence upon irritable and inflamed mucous surfaces, and is hence efficacious in chronic inflammation of the mucous lining membrane of the intestines, and in piles, diarrhea, and dysentery. The following has afforded considerable relief to pregnant females suffering with piles, and has effected cures at other times:—Take of Solomon's Seal four ounces, powdered Rosin two ounces, boiling water two pints, Molasses one pint. Simmer gradually to one pint and a half, and strain. The dose is a wineglassful three or four times a day.

CORNU CERVINÆ CALCINATUM.

CALCINED DEER'S HORN.

This is prepared from the horns of the deer, *Cervus Virginianus*. These are to be gathered while *in velvet*, or during the period between August and December, just before they fall off. Horns which have fallen from the deer will not answer. They are to be reduced to a coarse powder by means of a rasp, placed in an iron vessel, covered up tightly, and exposed to a heat of 195 or 200 deg., with constant agitation of the powder, and which should be continued for forty-eight hours, or until the whole becomes of a light brown color, like roasted coffee, and is easily pulverizable. Then, when cool, pulverize it, and keep it in well-stopped bottles.

This powder is a powerful styptic, and is of much efficacy in menorrhagia and uterine hemorrhage. From its promptness in checking hemorrhage after delivery, it may probably possess some influence upon the contractile power of the muscular fibers of the uterus, aside from its styptic action. It is given in drachm doses of the powder, repeated every half hour until the hemorrhage ceases permanently; or, a drachm of the powder may be added to a gill of hot water, and a tablespoonful of the infusion be administered every five or ten minutes. It most generally lessens the discharge soon after the first full dose, seldom requiring more than the third to cause its permanent cessation. Some practitioners combine it with the compound powder of Ipecacuanha and Opium, Capsicum and Opium, etc., and, as they suppose, with increased benefit.

CYPRIPEDIUM PUBESCENS.

YELLOW LADIES-SLIPPER.

An indigenous, perennial plant, sometimes called *Nerve Root*, *American Valerian*, etc. There are several varieties of this plant, the roots of which are stated to be tonic, stimulant, and antispasmodic. It is extensively used in the nervous disorders of females, both during pregnancy and in its absence. In the following combination, it forms a valuable remedy for the nervous headache to which many females are subject.

℞. Hydro-alcoholic extract of Yellow Ladies-slipper,
Hydro-alcoholic extract of Black Cohosh,
Scutellarin, of each, one drachm. Mix.

Divide the mass into sixty pills, of which one may be taken every two, three, or four hours. This will also be found beneficial in many instances of nervous irritability accompanying affections of the uterus, as well as in sleeplessness during pregnancy.

The fluid extract is an eligible form, and may be substituted in the above preparation, being mixed with the fluid extracts of the other articles. I have found the fluid extract prepared by Tilden & Co. to possess all the properties of the root in a concentrated form.

The dose of the powdered root is from ten to sixty grains; of the tincture, from one to three fluidrachms; of the hydro-alcoholic extract, from one to fifteen or twenty grains; of the fluid extract, from half a fluidrachm to a fluidrachm—the dose of either preparation to be repeated three or four times a day.

CYPRIPEDIN, is the name given to the concentrated preparation obtained from the root. It possesses all the virtues of the root in an increased degree, and may be administered in doses from half a grain to three grains, three or four times a day. Scutellarin, Caulophyllin, Cimicifugin, Valerianate of Quinia, etc., may be advantageously added to it in many instances. Prof. Cleaveland gives the following method of preparing it:—"Distill off the Alcohol from the tincture of the Ladies-slipper root until it is of a syrupy consistence, and then precipitate the resin with water, and carefully wash away the pectin and other soluble matter, which will leave a nearly pure, but not chemically pure resin." This, however, is not the semifluid or oleo-resinous preparation which has been used for the last three or four years, and which is obtained by a mode of procedure similar to that for procuring Iridin, Asclepidin, Podophyllin, etc.

DATURA STRAMONIUM.

STRAMONIUM.

A bushy, annual plant, growing in various parts of the world, and quite common to this country. The leaves and seeds are the parts employed, and possess similar properties. It is a powerfully narcotic poison in large doses, but may be safely and beneficially exhibited in small ones. It has been employed in the form of tincture, and extract, in uterine difficulties, especially in dysmenorrhea, neuralgia of the uterus, and in [illegible] in peritonitis, gastritis, enteritis, severe [illegible] egmasia dolens, etc., I have found the use of a poultice of the fresh leaves, bruised, one of the most efficacious local applications I have ever met with, promptly subduing the inflammation and allaying pain. (See my remarks on pp. 584 and 598.)

In painful affections of the limbs or joints, the poultice of fresh leaves, or a plaster of the alcoholic extract, will be found very beneficial, as also to swelled breasts, painful hemorrhoidal tumors, and neuralgic pains. In the periodical headache common to some females, the following pill will be found of service:

℞. Extract of Stramonium, from one-fourth of a grain to one half,
Sulphate of Quinia, two grains,
Sulphate of Morphia, one-fourth of a grain,
Mix with simple syrup, for a pill.

One pill to be taken two or three times a day. In some cases it will be found advisable to omit the Morphia, and substitute one grain of Capsicum.

The dose of the tincture of the bruised seeds, is from five to forty drops, two or three times a day, gradually increased, if required, until it affects the system; of the alcoholic extract, from the one-sixteenth of a grain to a grain, two or three times a day.

DIOSCOREA VILLOSA.

WILD YAM.

A very valuable perennial, indigenous plant, the root of which is stated to be antispasmodic; but its properties are not thoroughly and satisfactorily ascertained. It is very valuable in the nausea and vomiting of pregnant women, in spasm or cramp of the stomach, and other spasmodic affections, and may be used alone, or in combination with the Cornus Sericea, or the Viburnum Opulus. It is usually given in decoction of the root, of which from two to four fluidounces may be given for a dose, and repeated every half hour until relief is obtained. In bilious colic it is superior to any other article known, giving prompt and permanent relief in the most severe cases: the above dose may be repeated every fifteen minutes in this affection.

DIOSCOREIN, is the name given to the concentrated preparation obtained from the root, and which bears the same relation, as a specific, to bilious colic, as Quinia does to intermittent fever. It is also useful in flatulence, borborygmi, etc., in which it may be given alone or in combination with Asclepidin, Ginger, etc. In after-pains, a combination of Dioscorein, Caulophyllin, and Viburine, equal parts of each, will be found of value, as well as in cramps of the stomach, and painful spasmodic affections of the bowels; and in the nausea and vomiting of pregnant women, it may be efficaciously combined with the extract of Cornus Sericea. In many uterine affections, benefit will be gained, by uniting it with Senecin, Aletridin, Cimicifugin, Caulophyllin, etc. The dose is from one to three or four grains, repeated as often as the urgency of the symptoms require. In bilious colic, it is usually exhibited in doses of four grains, rubbed up with a tablespoonful of brandy, and repeated in about ten or twenty minutes.

ERECHTHITES HIERACIFOLIUS.

FIREWEED.

An indigenous, annual plant, possessing tonic, alterative, and astringent properties. A decoction of the plant, or a spirituous extract, has proved useful in profuse menstruation, and in the summer complaint of children. The volatile oil, however, is principally used in obstetric practice, to check uterine hemorrhage, which it frequently does with promptness. It has likewise been found useful in spasms of the stomach and bowels, hysteria, and the diarrhea of pregnant females. Triturated with extract of Stramonium, it affords an elegant application for piles. The dose of the oil, is from five to twenty drops, on sugar, or in emulsion.

ERIGERON CANADENSE.

CANADA FLEABANE.

An indigenous, annual plant, common to the northern and middle sections of the United States. The volatile oil is stimulant and carminative, and exerts a powerful influence in menorrhagia, and uterine hemorrhage. From two to ten drops, on sugar, or dissolved in alcohol and mixed in a little mucilage or sweetened water, may be administered in uterine hemorrhage, and repeated every ten or twenty minutes, as required; it usually acts promptly. It may possibly have some other influence in checking uterine hemorrhage, than that of a mere astringent, for, without the muscular fibers of the uterus are caused to contract, I do not believe the hemorrhage, after delivery, can be checked.

It is sometimes combined with tincture of Ergot, essence of Cinnamon, tincture of Cinnamon bark, tincture of Rhatany, or Laudanum, with advantage.

The oil will likewise be found useful in diarrhea, dysentery, and summer complaints of children; and mixed with five or six parts of Castor Oil, or of Stramonium ointment, it forms a valuable application to piles.

FIRING.

Obtain a thick iron-wire shank, about two inches long, and inserted into a small wooden handle; on its extremity, which must be slightly curved, have a disk or button of iron, exactly one-quarter of an inch thick, and half an inch in diameter. The whole instrument to be only six inches in length. The face of the disk for application must be flat.

To apply it, light a small spirit lamp, and hold the button over the flame, keeping the fore-finger of the hand holding the instrument at the distance of about half an inch from the button. As soon as the finger feels uncomfortably hot, the instrument is ready for use, and the time required for heating it to this degree, will be about half a minute. It is to be applied as quickly as possible to the parts, the skin being tipped successively, at intervals of half an inch over the affected part, as lightly and as rapidly as possible, always taking care to bring the flat surface of the disk fairly in contact with the skin. In this way the process of firing a whole limb, or the loins, making about one hundred applications, does not occupy much longer than a minute, and the one heating by the lamp suffices. To ascertain whether the heat be sufficient, look sidewise at the spots as they are touched, and each spot will be observed to become of a glistening white, much whiter than the surrounding skin. In from five to thirty minutes the skin becomes bright red, and a glow of heat is felt over the part. The iron must never be made red-hot—it is to be very little hotter than boiling water—should never make an eschar, and rarely raise a blister. On the next day after its application, a number of circular, red marks will be seen on the skin, the cuticle not even being raised, and the surface ready, if necessary, for a fresh application. There is no discharge whatever, and in most cases the patient is unconscious of what has been done. It is vastly superior to a blister in many cases; even the most delicate female will not object to its frequent repetition when required.

This is a powerful counter-irritant, and has been recommended in paralysis, rheumatism, sciatica, lumbago, etc. I have found it useful in checking abortion, especially in cases of habitual abortion, to be applied every day or two at the aborting period, in connection with the other internal treatment; it must be applied over the sacrum. It will also be found beneficial in relieving pains in the back and loins from uterine difficulties.

GALIUM APARINE.

CLEAVERS.

An indigenous, annual plant, possessing refrigerant and diuretic properties, and which is useful in suppression of urine, heat of urine, inflammation of the kidneys and bladder, and in all febrile and inflammatory diseases. It is generally given in infusion, made by macerating an ounce and a half of the herb in a pint of warm water, for two hours, of which from two to four fluidounces may be given when cold, and repeated three or four times a day.

The inspissated juice is useful in lichen, cancer, psoriasis, lepra, eczema, and scrofula, and may be given in one or two drachm doses, repeated three times a day. The infusion made with cold water, is said to be efficacious as a local application for removing freckles from the face, as well as in several obstinate cutaneous eruptions; the diseased parts must be washed with it several times a day, and, in case of freckles, continued for two or three months.

GALVANISM.

Galvanism, or electro-magnetism, has been frequently applied with success in many uterine diseases, and for several purposes during parturition. It has been employed in dysmenorrhea, amenorrhea, prolapsus uteri, and in several difficulties connected with pregnancy and labor. I have never used it in labor, but have found it a valuable agent in many diseases common to females.

Dr. Thos. Radford of Manchester, England,[°] was first led to its use in midwifery, from observing its value in a case of atony of the bladder. He has used it

---

[°] As but little attention has been paid to this subject in our own country, the following quotation is given entire from Braithwaite's Retrospect, part 29, pp. 259–268, and which, it is to be hoped, will not only fully repay the reader for his trouble of perusing it, but will induce him to make further investigations of the powers of an agent pos-

"1st. In cases of tedious labor arising from uterine inertia.

2d. In cases of accidental hemorrhage, either before or after the rupture of the membranes, and especially when exhaustion from loss of blood exists.

---

sessing such apparently valuable and important uses. The article is by Dr. Robert Barnes, Lecturer on Midwifery to the Royal Free Hospital Medical College.

"Defective uterine action does not always indicate a resort to the ordinary means of stimulating the uterus. There are no occasions in obstetric practice in which nicer discrimination — a more accurate diagnosis — is required, before deciding upon the means of relief, than in those cases where the contractile energy is at fault. Our choice must frequently lie between the use of agents calculated to excite contraction and those which have a directly opposite effect. We are frequently called upon to determine whether it be better to rouse the energies of the uterus, or to resort to manual or instrumental assistance. Upon our interpretation of the symptoms, and our appreciation of all the circumstances of the case, our selection of the mode of interference will depend; and upon this selection may hang the safety or the destruction of the patient.

If it be difficult to solve the preliminary question, whether we should endeavor to excite the uterus to action or not, how cautious ought we not to be in our choice of the particular means for inducing contraction, when that course is determined upon?

The action of Ergot of Rye, and the Objections to its use.—There is one agent frequently—much too frequently—resorted to on account of its power of exciting uterine contraction, the Ergot of Rye. A principal object of this paper will be to exhibit the dangerous properties of this drug; to show what little mastery we have over its action when once administered, and the consequently fatal results attending an error in diagnosis—a mistake in the application of the drug. If I further succeed, as I hope to do, in proving that we possess another agent at once more effective, more manageable, and more safe, and capable of useful application in all those cases in which Ergot of rye is commonly employed, I shall not have uselessly engaged the time of the reader.

The ergot of rye is capable, under certain circumstances, of producing the most marked and decisive effect in exciting the uterus to contract. An agent possessing such a power, it need not be said, is liable to abuse. It is notorious that many practitioners carry this drug in their pockets, esteeming it an indispensable adjunct to the practice of midwifery. It is among midwives—necessarily the most ignorant of obstetric practitioners—that this custom chiefly prevails. That this should be so is most deeply to be deplored. No agent, no species of interference in natural parturition, supplies more frequent or more distressing illustrations of that maxim, the most trite, the truest, and the most neglected, 'a meddlesome midwifery is a bad midwifery,' than does the ergot of rye. For one woman who has derived substantial benefit from its use at the time of labor, it may confidently be assumed that one hundred have found reason in long-enduring subsequent sufferings to rue the hour when they were made to swallow the nauseous draught under the delusive promise of a speedy release from pangs, hard indeed to bear, but mostly beneficial in their result.

In discussing the uses of ergot in obstetric practice, I think it more convenient to postpone the consideration of its use in inducing premature labor, and to refer in the first place to its employment in labor at the full time. When ergot is administered before the expulsion of the child, the effects are usually as follows:—In virtue of its peculiar property of exciting contraction of the uterus, in about fifteen or twenty minutes the uterus is perceived to be under the influence of the drug. A spasmodic contraction begins in the uterine muscular fibers. Whether this is excited by the direct stimulus of an ergotic element carried in the blood to the uterus, and thus acting

3d. In cases of "placenta prævia," in which the practice of detaching the placenta is adopted, and the vital powers are greatly depressed.

4th. In cases of internal flooding before or during labor.

5th. In cases of post-partum floodings.

---

immediately upon the uterine nerves or muscular fiber, or whether the ergotic element acts primarily upon the spinal marrow—that is, whether the first step in ergotic labor is of eccentric or of centric orgin, it is not easy to determine. But it is quite certain that when once the contractile energy of the uterus is roused, that other actions, violent in proportion to the effects of the uterus, are brought into operation. Secondly, diastaltic or reflex action of the expiratory muscles is induced with a violence in direct relation to the violence of the primary uterine contraction. If there be no invincible obstruction to the expansion of the mouth of the womb and the expulsion of the child, the child will be driven with precipitate fury through the pelvis and os externum, at the imminent risk, however, of lacerating the perineum, which has had no opportunity of expanding gradually and safely, as it does before the normal pressure of a labor completed by the natural powers. It should be respected as a fundamental axiom in obstetrics, that as child-bearing is a natural function, so is its safe fulfillment insured by adequate contrivance. Each step in the long process of parturition—from the first action of the uterine muscular fibers which determines the expansion of the os uteri, to the final contractions which expel the placenta and close the open mouth of the uterine vessels—is only one of a gradation disposed according to a pre-ordained order, with a view to the final result. To invert or to disturb this order, as the use of ergot in natural labor can hardly fail to do, by anticipating the due period of the expulsive pains, is to disconcert all the arrangements of nature; to throw the whole process of parturition into confusion; to resign to the uncontrollable fury of spasmodic action that process which depends for its safe completion to mother and child on a regular co-ordination of physiological actions, in which each stage is essential to the proper progression of the succeeding one.

But if an unforeseen obstruction exist, then more terrible results must be apprehended. When an obstruction occurs in the course of labor, it frequently happens that nature takes the alarm; the uterus, so to express it, seems gifted with a kind of prescience that the obstacle is beyond its power to overcome. It therefore intermits or ceases those contractile efforts, which, if continued, would entail either rupture of its own structure or impaction of the child: the contractions become abortive. Now, when ergot is given, it is presumed that a reason is discovered for its use in the intermission or cessation of the pains. This intermission or cessation may arise—

1st. From this prescient reluctance of nature to act in the face of a mechanical obstacle.

2d. From *exhaustion*, in consequence of long-continued unavailing efforts.

3d. Because the proper time for expulsive efforts has not yet come, and the proper physiological stimuli to diastaltic action have not come into operation.

Now, in every one of these cases the action of the ergot of rye is likely to be prejudicial; first, if in the case of an obstacle to the progress of the child, ergot be given, and its peculiar action ensue (which fortunately is not always), then the uterus contracting, and vainly contracting, upon the opposing force, is goaded by opposition into more furious efforts. Before its ungovernable struggles something must give way. Rupture of the womb is one probable termination; or the child may be jammed in an unfavorable position into the pelvis and there impacted, and convulsions and death may close in the scene. All this I have actually witnessed.

6th. In cases of hour-glass or irregular contraction of the uterus.

7th. To originate, *de novo*, uterine action, or in cases in which it is desired to induce premature labor.

When the contraction has ceased from exhaustion, to what purpose will you lash the jaded uterus to renewed exertions of which it is incapable? In such a case ergot can manifestly have none but the most injurious effect. And yet it is in such cases that it is frequently resorted to.

It may be urged that these are not fit cases for the use of ergot, and that its injurious action here can not be advanced as an argument against its employment in proper cases. This may be so. But then how difficult is the diagnosis—how fatal a mistake! And if ergot be a drug in such common and extensive use as it is known to be, and that among the most ignorant, how can we expect the diagnosis to be just, or that errors shall not be frequently committed?

The uncontrollable action of the drug when once administered, added to the difficulty of diagnosis, constitutes the gravest objection against it. A mistake is irretrievable; once given the case is as it were out of our hands. We know of no certain means of mitigating or counteracting its effects when they turn out to be violent or altogether injurious. I propose to pass in rapid review some of the proofs of the dangers attending the use of ergot in obstetric practice, dangers too much overlooked, if not ignored, by many.

I will first consider the *dangers to the mother.*

Rupture of the uterus.—Dr. Trask, who analyzed the histories of all the cases he found recorded, found that in a large proportion ergot has been given. It is quite true that in many of these cases the ergot was given in contravention of the rules usually laid down. In some there was obstruction to the labor from distortion of the pelvis, mal-position or mal-proportion. But this consideration does not diminish the value of the general fact, that ergot has frequently caused rupture of the uterus. If given before the head has descended into the pelvis, who can determine, even in the case of a well-formed pelvis, that an obstacle will not arise in the unusual or morbid enlargement of the head? If given even when the head is pressing on the perineum, the os perfectly open, and all those conditions apparently present which are held to justify the resort to ergot, who can tell whether a second or a third child may not be behind? And who would knowingly goad the uterus into spasmodic fury in case of twins? How great is the probability that the second child would be driven into the pelvis in a transverse position? Even up to the moment when the head is about to emerge from the outlet the use of ergot then is not safe, and I shall presently show that is not necessary.

The next accident is *rupture of the perineum.* The danger of this accident is so obvious that I need not do more than record it.

Lacerations of the os uteri, subsequent inflammation, and hypertrophy of the cervix, are events which I have frequently traced back to ergotic labor.

Prolapsus and procidentia of the uterus and bladder.—These distressing affections are not unfrequently the secondary result of inflammation and hypertrophy of the cervix uteri; but even when not thus the indirect consequence of ergotic labor, they may result directly from the violent dislocation occasioned by ergot contractions. I have known a striking case of this kind.

Case 1.—A woman had ergot given to her in a perfectly natural labor, to expedite delivery. It brought on one continued pain of a character and intensity such as she had never experienced before, and during which, to use her own expression, she felt as if "the whole of her body was coming from her." The child was violently extruded, and the uterus and bladder were driven down by the secondary excited action of the

8th. In cases of abortion, when the indications show the necessity, or justify the expulsion of the ovum.

9th. In cases of asphyxia in infants.

---

expiratory muscles into the pelvis, the bladder remaining outside the labia pudendi. It was not until some time had elapsed, and careful general and local treatment, that these organs were restored to their normal position.

Ergot may induce certain injurious effects upon the mother's system. Dr. Hardy relates, that in 'several cases where the circulation of the patient had undergone depression from the action of ergot, the effect continued for several days, notwithstanding in some instances the inflammation of the uterus followed delivery, and the uterine tumor not unfrequently remained much larger than natural, even when there was no inflammation.' Dr. Hardy also quotes the eminent authority of Dr. Johnson to the fact that 'the volume of the uterus is often found much greater than after ordinary labors, imparting to the hand almost the feel of a uterus before the expulsion of the placenta.'

Drs. Hardy and M'Clintock have observed a marked diminution in the frequency of the mother's pulse in from fifteen to twenty minutes after the administration of ergot. And all concur in noticing the dangerous depression following the use of ergot when given in cases where the powers of the system have been reduced by hemorrhage. In one such case ergot was almost immediately followed by most alarming symptoms, and depression requiring the most powerful stimulants. In several cases the depressed state of the circulation continued several days.

Dr. Ingleby relates the following case:—'A highly-esteemed friend once found it necessary to pass his hand into the uterus to remove an adherent placenta, the ergot of rye having been previously administered. The introduction was carefully performed. The straining and opposition to his efforts on the part of the woman were exceedingly great, and at the moment when the operator's hand had reached the organ, my own hand making counter-pressure on the abdomen, the patient became violently convulsed, and died in less than a minute.' The cause of the convulsion, Dr. Ingleby expressly states, was not loss of blood.

We will now consider *the injurious effects of ergot upon the child.*

Drs. Hardy and M'Clintock observed that the pulsations of the fetal heart underwent a similar diminution in frequency to that witnessed in the mother, and that this was succeeded by irregularity and intermission, and that it became *inaudible.* Dr. Hardy, Dr. Beatty, and others, after careful observation directed to this point, assert that unless the child be born within a limited interval from the administration of the drug, it will be still-born. The excessive mortality of the children in ergotic labor is a fact well-established, although disputed by some practitioners enthusiastic in the praises of ergot. The Prefect of the Seine had observed an almost regular annual increase in the number of still-born children, and he was informed that in a large number of these cases ergot of rye had been given during labor. He put the following question to the Academy of Medicine:—'What may be the influence of ergot of rye on the lives of infants, and on the maternal life?' The report made by a commission of the Academy, consisting of Orfila, Adelon, Villeneuve, Merat, and Danyau, contained the following conclusion:—'Ergot of rye administered improperly causes death to the fetus, and injury to the mother.' The immediate source of danger to the fetus is either the toxical property imparted to the blood, or the interruption to the circulation through the uterus and the placenta, occasioned by the long-continued contraction of the uterus. In this latter case the child may perish from asphyxia. These are the usual sources of danger; but there is a third. The long-contin [illegible] pressure to which the child is subjected

Galvanism is especially advantageous, as a general stimulant, in all those cases in which the vital powers are extremely depressed from loss of blood. Its beneficial effects are to be observed in the change of the

---

during ergotic labor may compress the brain beyond the limit of endurance, or it may impede the circulation through the umbilical cord. The toxical agency of the ergot upon the fetal heart is exemplified in the observation already referred to of Dr. [illegible]. The influence of contraction of the womb in arresting the circulation through the placenta, and consequently the fetal circulation, has been demonstrated to me by actual observation. The case is so interesting, and the opportunity of making a similar physiological experiment must be so rare, that I will cite it in detail.

Case 2.—A woman, with an extremely contracted pelvis, and who ten years before had been delivered by craniotomy by Dr. Waller, consulted me about her condition. She was again pregnant. I became satisfied of the propriety of inducing premature labor; and the agent I determined upon employing was galvanism. Having waited until it was estimated that seven months of gestation had passed, the operation was commenced. I shall have to relate presently the course of the labor under the use of galvanism, and may therefore pass at once to the particular point it is my present wish to illustrate. The labor had set in, and the os uteri was partially expanded, the cord came down into the vagina. The pains being of a languid, uncertain character, the galvanic stimulus was kept up. The pulsations of the cord were strong, and 80 in the minute. Galvanism was applied during the pains; the contractions were sensibly increased in force, and during the contractions the pulsations in the cord became intermitting, and occasionally stopped. As the pain went off, and as the galvanism was discontinued, the pulsations resumed their former strength and regularity. I then tried the effect of galvanism in the absence of a pain. Contractions were induced, and the intermittence of the pulse followed.

I then observed the effect of a pain uninfluenced by galvanism. The intermittence of the pulse was the same. I repeated these observations several times, and always with the same result. Toward the termination of the labor a strong expulsive pain came on, during which, the head, which was very small, was driven into the vagina, without, however, causing any pressure upon the cord. During the strong pain the pulsations in the cord stopped entirely, but returned when the pain went off.

But fetal circulation is arrested during the physiological contractions of the womb for a short time only, and is completely restored during intervals sufficiently long to insure the safety of the child. In ergotic contraction the interruption is total, unremitting and protracted. Shall we wonder if the child occasionally perishes from asphyxia?

Dr. Ramsbotham, whose experience in the use of ergot in inducing premature labor is probably greater than that of any other practitioner, says:—'After a great number of trials, I observed that although the mothers recovered as well as if through an ordinary labor, their systems not being in any sensible degree injuriously affected by the drug, yet that the proportion of children still-born was greater than when the membranes were punctured. This I attributed to the baneful influence of the medicine upon the fetus.' Dr. Ramsbotham modified his practice in consequence. He further says that 'Wright's experiments prove decisively that the medicine has a most prejudicial influence upon the young *in utero*, even to their destruction.'

If the child survives the perils of ergotic labor, is it free from subsequent danger?

Dr. Ramsbotham says:—'It has happened to me in four different instances to witness the death of the fetus, a few hours after birth, by convulsions. [illegible] induction of premature labor by ergot.'

These facts, which might be greatly multiplied, p

is capable of exerting the most deplorable and countenance, restoring an animated expression; in its influence on the heart and arteries; in changing the character of respiration; and its warming influence on the general surface. I have several times

---

and the child. It follows from this circumstance, the uncontrollable nature of its action, and the difficulty that exists in many instances of forming an accurate diagnosis, that the use of the ergot of rye in obstetric practice should be reduced within the narrowest possible limits. I believe that the restrictions to its use must be carried very much further than is generally prescribed. It is a matter of extreme doubt to me whether it should ever be administered before the child is born; and in cases of uterine inertia after delivery, accompanied with retention of the placenta or hemorrhage, it has been shown to be by no means free from objection. But the most effectual way of attaining the object I propose, of minimising the use of ergot in obstetric practice, is to show that we possess other means at once more safe, more effectual, and capable of successful application in all those cases in which the ergot has been recommended.—*Lancet, Nov. 5*, 1853, *p.* 433.

[Dr. Barnes, passing over all these slighter stimulants to uterine action, such as restoring hope and confidence in the patient, pressure of the hand on the womb, application of cold, etc., etc., proceeds to consider the value of galvanism as a substitute for ergot.]

From time to time many valuable but isolated observations upon the use of galvanism in different cases of obstetric practice have been published. But no systematic attempt has been made to prove that in galvanism we possess an agent capable of universal application wherever we require a safe and effectual stimulus to the muscular structure of the uterus. I shall consider the uses of galvanism in the successive epochs of gestation and parturition, beginning with its use in the induction of premature labor.

The Use of Galvanism in the Induction of Premature Labor.—In 1803, Herder suggested the use of electro-galvanism for the induction of premature labor. In August, 1844, Drs. Horninger and Jacobi succeeded in bringing on labor by the electro-galvanic apparatus after other means had failed. The application was immediately followed by uterine action, and the child was born in an hour from the commencement of the operation. A successful case under the hands of Mr. Demsey is also referred to by Dr. Golding Bird. My researches into what has been written on the subject have not been sufficiently minute to enable me to say that no other similar cases have been recorded. In January 1851, I myself had an opportunity of testing the efficacy of this agent.

Case 3.—I have already referred to this case for the purpose of illustrating the effect of contraction of the uterus upon the fetal circulation. The result, although perfectly satisfactory, was by no means so speedily accomplished as in the case of Horninger and Jacobi. I had previously endeavored to bring on labor by puncturing the membranes, and inserting a sponge-plug in the cervix uteri. This proceeding was followed by no symptom of labor. On the 23d of January I applied the galvanic battery for half an hour, placing one pole on either side of the uterus. Immediately after commencing the shocks the bladder was irresistibly emptied, to the evident annoyance of the patient. The womb was felt to become hard, and the patient herself was sensible of contractions and increased movements of the fetus. The contractions did not continue on the cessation of the galvanism, and I therefore repeated the application on the 24th and 26th, for about an hour each time. On the 26th a 'show' took place. On the evening of the 27th, slight pains were felt; the cord was presenting, a small loop coming through the os uteri, which was now dilated to the size of a shilling, but feeling rigid. She had had rather copious flooding in the daytime, but it had stopped. The head was felt lying on the pubes in front of the os uteri, the cord coming down in the free space behind it. On the morning of t [illegible] nism having been applied at intervals all night, the observed, in cases in which other powerful stimulants have failed to produce any beneficial effects, the most decided advantages accrue after its application.

---

pains had increased. I have already mentioned how the galvanism increased or originated contraction. At nine A. M. the child was born. It was apparently not more than six months old. The patient had certainly reckoned falsely. The child's heart was pulsating; the chest made three or four convulsive heaves, at which the mouth opened, but no air seemed to enter; the lungs refused to expand; the walls of the chest were drawn in toward the spine. I endeavored to excite respiration by the galvanic apparatus, but, although I could at will cause a respiratory *effort*, the child was evidently too immature to live. The womb contracted favorably, and the placenta being withdrawn was found healthy. The patient recovered without a bad symptom.

The excellent effect of galvanism in this case led me to recommend the use of the same agent to my friend Mr. Mansford, who has favored me with the following account:

Case 4.—'The lady whose case led me to attempt the induction of premature labor, was in the 41st year of her age, and the thirtieth week of her fifth pregnancy. On the 8th of November, 1852, having ruptured the membranes, I introduced one wire of the apparatus within the os uteri, and placed the other in concord with the spine. From the one introduced into the uterus I had removed the brass handle, and twisted the wire upon itself so as to form a loop sufficiently curved to insure its remaining steadily in its proper place. I also carefully enveloped a considerable portion of this wire with lint, as well to protect the vagina from the twisted portion and extremity, as to prevent the galvanic current from being diverted from the uterus. I then increased its power until it produced 'the most severe cutting pains in the loins,' 'great bearing-down,' and 'a dreadful commotion in the womb.' These were my patient's own expressions. The operation was repeated on the 9th and 10th, each morning for half an hour: the effect, however, had not been as yet altogether satisfactory, as I had not been able to maintain a continuous action; but on the fourth morning, viz., the 11th, I remedied this defect, and kept up a continuous current for three-quarters of an hour, when my patient begged me to desist, which I did, and determined to wait a few days to see if this would accomplish the desired effect. Happily, on the 14th, without any further interference, labor commenced, and terminated within four hours, in the birth of a living child, and not a single untoward symptom occurred spontaneously. It was altogether a most satisfactory case.'

The foregoing results are directly at variance with the opinion of Dr. Golding Bird, who says: 'The result I have arrived at is, that this agent, like the ergot of rye, and perhaps other *ecbolic* remedies, generally fails to develop uterine action *de novo*. . . . Hence, though I believe it will generally fail to induce premature labor, it will as generally succeed in stimulating the uterus to vigorous contraction after labor has actually commenced.' In weighing this negative opinion, it should, however, be observed, that the latitude of qualification implied in the word '*generally*,' deprives it of all precision of meaning.

It would lead me beyond my present purpose to discuss the relative advantages of galvanism and the douche recommended by Dr. Kiwisch, and other methods. I will simply remark, that whatever method be determined upon for the purpose of bringing on labor, the stimulating property of galvanism upon the uterus will be a most useful adjuvant.

I will briefly refer to the great superiority of this method over the use of ergot of rye. An unexpected obstacle to the expulsion of the fetus may arise after the administration of ergot; there is, consequently, danger of rupture of the uterus. How, for example, can we foretell that the child will not be driven into the pelvis in a transverse position?

I have never observed that the child, in utero, has been injured by its use, which gives it a great advantage over the administration of secale cornutum, which, in many cases, is destructive of it. "This drug

---

Secondly, there is the great improbability that the child will be born within any reasonable period after the administration of ergot; many doses are required; there is the risk of ergotism to the mother; and the peril to the child rises in proportion to the amount of ergot given; moreover, it is extremely uncertain whether the ergot will act at all.

The Use of Galvanism in Inertia during the First and Second Stages of Labor.—I will now illustrate the effect of galvanism in lingering labor from uterine inertia. An interesting case of this nature is recorded by Mr. Cleveland, which was brought to a close within fifteen minutes after the use of the electro-galvanic apparatus had been commenced. Mr. Houghton also relates four cases of arrested labor from atony of the uterus, brought to a successful termination by the agency of galvanism. In three of these ergot had previously failed.

In a similar case I have myself experienced the like good effect, but I prefer citing the following account supplied to me by my friend Dr. Mackenzie:—

Case 5.—'I was sent for, one morning, to a young woman who had been admitted in labor at the Paddington Infirmary, and on examination I found that the head presented. Although she had been several hours in labor, the os uteri was but little dilated. I saw her in the course of the same afternoon, but still found very little dilatation. At ten P. M. but little progress had been made. I now determined to try the effect of galvanism, and applied one pole of a single-current machine to the spine, and the other, by means of Radford's director, to the neck of the uterus. The current was from time to time intermitted, and uterine action of a vigorous character was excited. In about an hour a fine living child was born. So vigorous were the expulsive efforts during the passage of the head through the os externum, that I was obliged to take particular pains to prevent rupture of the perineum. The impression left on my mind by this case was, that galvanism should not be employed except very cautiously in primiparæ, or in any other instance in which the perineum is rigid or imperfectly developed.'

Galvanism may also be usefully employed in many cases of hemorrhage before the birth of the child.

A judicious application of this agent may, in many cases of arrest of the head from inertia, obviate the necessity of resorting to the use of the forceps.

The Use of Galvanism in the Third Stage of Labor, and in Hemorrhage.—We possess a greater amount of evidence of the value of galvanism in the third stage of labor. Dr. Radford has contributed many valuable observations, exemplifying the power of galvanism in exciting contraction of the uterus in cases of post-partum hemorrhage. These are too well known to require to be cited. Mr. Houghton has added other cases which occurred under his own observation. The only instance I will adduce here, is one which occurred recently to Dr. Mackenzie.

Case 6.—'The patient had been upward of forty-eight hours in labor, under the care of Dr. Keogh, who called in Mr. Clark, by whom I was sent for. When I [illegible] the patient,
uterine action had entirely ceased, and I found, on exam [illegible] was im-
pacted in the pelvis, the face presenting with the chi [illegible] As the
patient was exhausted, an opiate had been given, a [illegible] re
agreed to meet again in some hours, and if uterine [illegible] y
the forceps. At the appointed time no return [illegible]
applied the forceps: the operation was acco [illegible]
woman was delivered of a fine, large, living
but the next day, on meeting Dr. Keogh,

is liable to great deterioration: its operation is not always certain, its failure depending sometimes, perhaps, on its inert qualities, but frequently on a constitutional idiosyncrasy which resists its powers. There

---

sion had been felt throughout the night as to the occurrence of hemorrhage, inasmuch as the uterus had remained flaccid and uncontracted, and at the time of my visit it reached above the umbilicus, and was very soft and flabby. I proposed galvanism, and applied one pole to the spine and the other to the neck of the uterus, occasionally intermitting the current. This was done for half an hour, and evident uterine action was excited, the uterus becoming harder and smaller, and on removing the poles two large coagula were expelled. The next day the uterus was more contracted and smaller, and no hemorrhage had occurred. Galvanism was again used for half an hour. The uterus certainly contracted under its influence. The following day no hemorrhage had occurred, and the condition of the uterus was such as not to require any further recourse to the agent. The woman from this time recovered in a most favorable manner.' Dr. Mackenzie adds the following remarks, in which I entirely concur:—'It appears to me that the results of galvanism in this case were highly satisfactory, because coagula retained in the uterus, from atony of the organ, are not only calculated to occasion hemorrhage, but by undergoing a species of putrefactive decay, to give rise to fever and all the consequences of vitiation of the blood. Under such circumstances, I have known the hand forcibly introduced into the uterus many days after labor for the removal of such coagula with very disastrous results,—results which this case shows may be obviated by having recourse to galvanism.'

Other Uses of Galvanism in Obstetric Practice.—There is another case of not unfrequent occurrence in Obstetric practice, in which galvanism may be of eminent service—temporary paralysis of the bladder following delivery. A case I have already related illustrates the power of galvanism in causing contraction of the bladder. Drs. Goodwin and Radford describe an interesting case, in which the catheter was employed two or three times a day, and could not be dispensed with. On Dr. Goodwin's suggestion, galvanism was tried, and *the first application proved successful.*

I would especially recommend the use of galvanism in those cases in which the action of the uterus has been unfortunately paralyzed under the influence of chloroform. In such cases, I believe no other stimulus that can be applied will answer with equal certainty or efficiency.

I am also sanguine as to the value of galvanism, in exciting respiration in asphyxiated children.

There is another class of cases in which galvanism promises to be of the greatest service. A most interesting case has been recorded, in which Dr. Tyler Smith was enabled to produce expansion of the neck of the uterus, and to bring an intra-uterine polypus into view, so as to admit of the application of a ligature, by the application of galvanism, after ergot had failed. I have also employed it with success, for the purpose of causing the expulsion of hydatids. This case occurred in connection with my colleague, Mr. Forbes, and I will relate so much of the account, as bears on the question before us.

Case 7. Ann W., aged 42, had had eight children and three abortions. She applied to Mr. Forbes, on the 17th of June last, having anasarca of the legs. Two months before, she suffered a burning pain in the region of the womb. She had menstruated up to Christmas last. Since that date there had been a little hemorrhagic discharge at intervals. For the last month there has been a continual discharge of colored fluid. Her health is much impaired, and her strength lowered. On the 18th while in bed, she felt a vaginal discharge, and on getting up, passed a large quantity of blood. The pulse was weak, thready, 108; face blanched; headache intense. No pain preceded the hemorrhage.

are organic states which forbid its use: when the os uteri is undilated or undilatable, the child being still alive, it ought not to be administered. If in such a case it induces a powerful tonic contraction of the

---

There was a tumor in the seat of the pregnant womb, extending more to the right side, and reaching to the umbilicus; it was firm and elastic, tender on pressure, which did not bring on labor-pains. The os uteri was the size of a shilling, and rigid. No placental murmur or sounds of fœtal heart heard. The breasts were quite flaccid. Os slightly expanded toward the afternoon. A dead fetus, or some diseased condition of the ovum was suspected. In consultation, Dr. Barnes suggested galvanism, to cause contraction; this had the desired effect, and Dr. Forbes was enabled to bring down a bunch of hydatids. The vagina was then plugged and the abdomen bandaged. The disposition to contraction thus given, more hydatids were afterward passed. Tincture of ergot of rye was then given in small doses. Early on the morning of the 19th, the patient passed a large mass of hydatids, which was expelled suddenly with a pain like that of labor. She was quite exhausted with loss of blood and previous disease; symptoms of inflammation appeared, and she sank the same night. The post-mortem examination revealed a large fibrous tumor in the walls of the uterus, and an advanced stage of granular degeneration of the kidney.

In such a condition of the uterus and the patient, none of the ordinary means of exciting contraction could have been employed with equal safety and advantage. The necessity of inducing contraction to expel the contents of the womb and arrest the hemorrhage was obvious, and the utility of galvanism in accomplishing this was manifest. I am disposed to regret that the galvanism was not more freely used. The expulsion of the hydatid placenta might have been hastened.

It is beyond the strict scope of this paper, but I may be permitted to refer to the advantages attending the use of galvanism in amenorrhea, hysteria, and other diseases of females, advantages which have been clearly established by Dr. Golding Bird, Dr. Gull and others. The stimulating influence of galvanism, is well worthy of trial for the purpose of exciting the lacteal secretion.

Mode of Applying Galvanism.—I have now gone through a series of illustrations, affording evidence of the use and value of galvanism, in most of the forms of labor characterized by defective uterine action, and in other cases where the indication is to excite the contractile property of the uterus. I will conclude this paper with a brief description of the mode in which this powerful agent should be applied, and a summary of the advantages it especially possesses in obstetric practice over the ergot of rye. The ordinary electro-magnetic apparatus in use for medical purposes is, I believe, the best form that can be employed. The principle of this apparatus consists in the induction of magnetic currents, by a current of electricity, and the production of a rapid succession of feeble shocks by continual interruptions to the current. I have observed that the uterine contractions are always provoked at the break and renewal of the circuit. Repeated shocks act as a far more effectual and certain stimulus to uterine contractility than a continued current. It is probably through inattention to this fact, that some practitioners have failed in effecting contraction of the uterus by means of galvanism. As to the mode of applying the poles, I do not think it necessary to apply one over the spine, and the other to the neck of the uterus, as is usually done. I have found the application of the disks, covered with thin flannel moistened in water, one on either side of the abdomen over the uterus, much more convenient, and quite as effectual. The practice of applying one pole over the spine, and the other to the neck of the uterus, further seems to me to be based upon an erroneous view of the mode in which galvanism acts upon muscular fiber. When the poles are thus applied, [illegible] and the other to the cervix uteri, it is doubt-uterus, it destroys the child. We can not control or confine its action, and therefore it is totally unsuitable to cases in which we only want a limited effect. Again, if exhaustion is an element in the case, it is

---

ful whether the ensuing contraction of the uterus is due to primary excitation of the spinal marrow. It is proved by the experiments of Matteucci, and it is confirmed by general observation, that *galvanism acts directly upon the muscular fiber*, stimulating it to contraction. It is clear that this direct action can be as effectually obtained by passing the shocks through the uterus, by placing the poles on either side of the abdomen. I would not be understood to affirm, that this immediate action of galvanism upon the muscular fiber, is its sole mode of action, but that it is the primary and essential one: this primary peristaltic action commenced, the secondary and tertiary diastaltic, emotional and voluntary, reactions upon the uterus follow. The duration of the application must depend upon the requirements of the case. It is often found that nothing but a primary excitation is wanted, and that this being supplied, the uterus will go on contracting spontaneously. In those cases where it is required to originate uterine contraction, as in the induction of premature labor, several applications of an hour's duration will be necessary. The uterus can not be roused to perfect action before the appointed time, without repeated stimulation.

The Special Advantages of Galvanism, as an Agent for Producing Uterine Contraction.—Among the advantages of Galvanism more especially worthy of attention are—

1st. The simplicity of the operation.

2d. The extensive range of cases in which it may be successfully employed, rendering the electro-magnetic apparatus a desirable addition to the armamentarium of the obstetric practitioner.

3d. The perfectly manageable character of the agent. Its action may be broken off and renewed at pleasure. The moment we think the uterus is acting too powerfully under its use, we may instantly withdraw the exciting agency, and leave the uterus to the ordinary physiological stimuli, which seldom impel the organ to undue activity. It moreover admits of easy regulation; both the strength and duration of this agent are completely under our command. We have it in our power to imitate, in a remarkable manner, the natural pains both as to intensity and intermission. Ergot has neither measure nor certainty.

4th. Its peculiar appropriateness and efficacy in cases of extreme exhaustion of the system, where deglutition is difficult or impossible, or where the stomach rejects everything; where any other mechanical application to the uterus is dangerous, or inconvenient, and especially where the introduction of the hand into the uterus would be likely to be attended by injury or even a fatal result. Indeed, it may be truly said, that in cases of extreme exhaustion, galvanism is the last resource left to us. The galvanic stimulus can be applied, when everything beside is out of the question. The uterine muscular fiber will respond to this stimulus, when the nervous system is utterly prostrate, when the heart has ceased to beat, when the patient is moribund or even dead.

5th. Galvanism is less exhausting to the system, than ergot or most other means of exciting contraction. It acts directly upon the uterine muscular fiber, and scarcely taxes at all the general powers of the system.

6th. It does not necessarily preclude or supersede the use of other remedies, tending to fulfill the same indication.—*Lancet, Nov.* 12, 1853, *p.* 456.

Dr. Mackenzie bore ample testimony to the correctness of Dr. Barnes' conclusions. He himself had been for some time engaged in testing the use of galvanism in cases of uterine diseases as well as in obstetric practice. He believed that there were four classes of cases, in which galvanism might be usually employed—1st, for the induction of wholly inapplicable, as we ought not to adopt any means which tend further to depress the vital powers. The powerful and sanitary influence of galvanism was most decidedly obtained in the preceding case," (referring to a case to which these remarks were appended), "and the great advantage of this agent is, that its effects may be carried to any degree, from first only exciting the uterus so to contract that its diameters are lessened, and that its tissue comes to be applied to the body of the child. These, however, may be at pleasure increased, so as to accomplish the expulsion of the child and placenta. The gradual changes produced upon the uterine tissues were admirably seen in the foregoing case, and also its great power developed by its continued application—to arrest the discharge, expel the child and the placenta, and leave the organ safe from the occurrence of post-partum flooding.—*Extracted from a case detailed in the proceedings of the local branch of the Provincial Medical and Surgical Association*, 1847.

In the above-named case, I used the poles externally, and have before this, and ever since adopted this mode of application.—*Lancet, Nov.* 26, 1853, *p.* 500.

The Galvanic Cautery has been employed by Mr. Ellis in the treatment of uterine disease:

"The instrument he employed was a good-sized silver catheter, straightened out, with the end cut off, which formed the body of the instrument. It was then slit open at the upper end and broached, so as to form a socket for the porcelain cauterizer, and also to allow the internal wires to pass out. Within the catheter are placed the two conducting wires, insulated, they being at one end connected with the wires of the battery, and at the other with a piece of platinum wire, which is coiled round the porcelain cauterizer. The battery employed is Groves', of four or five cells, and of these, two are required to heat the porcelain to whiteness, which degree of heat is essential. From this simple contrivance the instrument derives its principal value, the heat being thus

---

premature labor, as Dr. Barnes' cases proved; 2d, in the various forms of inertia uteri, during labor; 3d, in placenta prævia; in this condition, the blood which he believed escaped from the uterine arteries, could in no way be so effectually restrained, as by galvanism, which he believed would speedily develop the action of the uterus; 4th, there was another series of cases, of various forms of passive hemorrhage and leucorrhea. He related the case of a patient who had been delivered five weeks: for the first eighteen days she had been free from hemorrhage; hemorrhage had then set in; she became blanched, and exhibited evident marks of excessive loss of blood; this degenerated into passive hemorrhage. There was no disease of the cervix uteri. He applied galvanism the hemorrhage stopped, and on the next day it had not returned; the application was repeated. He was confident [illegible] we possessed an agent worthy of our further investigation."

both intense and permanent. When ready for use it is entirely under the control of the surgeon, a matter of vast importance in its application. The patient to be operated upon should be in the usual obstetric position, and the batteries and wires concealed from her, so that she should not have any idea of the nature of the remedy. A good light and speculum are essential, and the speculum best suited is the common circular glass one, or one of glass coated with gum-elastic. Neither the two-bladed metallic nor the conical glass forms are at all suited; the former because it allows all the heat from the blades of the speculum to be concentrated on those portions of the vagina which bulge between them, and the latter because it is liable to be easily expelled by the vagina. A full view of the os and cervix uteri having been obtained, the os should be cleansed with a piece of cotton or wool, and when the cautery has become intensely heated, it should be steadily introduced and quenched in the diseased tissue, the duration of the application and the depth of its introduction depending upon the effect required. The eschars thus produced are marked with a whitish-yellow border, and the cervix often visibly contracts under the application of the cautery. The author insisted upon heating the porcelain to whiteness, otherwise slight hemorrhage may occur, from the instrument dragging off a portion of mucous membrane, which invariably adheres to the instrument under such circumstances; the surgeon should also remember that the degree of the eschar is entirely under his control. He then stated that the cases where it was applicable were those of induration of the os and cervix uteri, of ulceration of the os, and in prolapsus uteri, and also in prolapsus of the anterior wall of the vagina."—*Lancet, Nov.* 26, 1853, p. 503.

GELSEMINUM SEMPERVIRENS.

YELLOW JESSAMINE.

This plant is common to the southern states, the root of which possesses sedative, relaxing, and antispasmodic properties, and is, undoubtedly, one of our most valuable agents. It is employed with success in all febrile and inflammatory forms of disease, in cases of nervous irritability, convulsions, etc. In obstetrics it has been efficaciously employed in dysmenorrhea, abortion, to allay the nausea and vomiting of pregnancy, or of labor, in gastrodynia, cramps, and odontalgia during pregnancy, in rheumatism of the uterus, rigid os uteri, hour-glass contraction, retained placenta, puerperal fever, puerperal convulsions, etc. As I have already alluded to its uses in these various conditions, under their appropriate headings, I will not repeat them here, but refer the student to them, as well as to the agents which may be given to counteract its influence upon the system, when too powerful, on pages 314-15.

Although, at first, in consequence of the many reports in circulation relative to the dangers of this article, it was given with great caution and reserve, yet, at the present time, it is used pretty extensively by all our practitioners, it having been found that the dangerous accounts related of it were very much exaggerated, and that when given with the same degree of prudence and discretion as would be exhibited in the administration of Morphia, Belladonna, Strychnia, Digitalis, Aconite, and other sedatives or narcotics, it forms a very useful and important medicine, incapable of effecting any injury upon the system.

The effects of this agent, when the system is properly under its influence, are, clouded vision, double-sightedness, inability to open the eyes, with muscular prostration of the whole system; these symptoms gradually pass off, leaving the patient in a few hours, refreshed and completely restored. As a general rule, so soon as the heaviness or partial closing of the eyes is induced, the medicine should be administered no longer; there may be cases, however, in which one or two subsequent doses may be given with safety and advantage, as in puerperal convulsions.

It is administered in the form of saturated tincture, and is frequently combined with the saturated tincture of Aconite, or Black Cohosh, for the purpose of facilitating its influence in lessening arterial action, allaying pain, relieving severe and obstinate cough, etc.

The dose of the tincture is from ten to sixty drops, in a wineglass half full of water, and which may be repeated every hour or two, according to the character of the disease, and the susceptibility of the system to its influence.

Sometimes, especially in persons of delicate habits, or those who are easily influenced by medicines, it will be found more advantageous to give the remedy in small doses, as ten, fifteen, or twenty drops, and repeat them at shorter intervals.

Its internal administration is said to be contra-indicated in congestive fever, where there is excessive prostration of the muscular or nervous system, and where there exists a determination to the brain or other vital organ. I must observe, however, that although I have no doubt of the correctness of this statement as relates to nervous or muscular prostration, I am inclined to doubt its correctness concerning the other affections referred to, no satisfactory evidence having yet been presented of its injurious action in these instances, but rather the reverse.

GERANIUM MACULATUM.

GERANIUM.

An indigenous, perennial plant, known also by the names, *Cranesbill*, *Crowfoot*, etc. The root is a powerful astringent, and has been successfully used in powder or decoction, in menorrhagia, diarrhea of pregnant females, summer-complaint of children, and aphthous ulcerations of the mouth. As a local application it is beneficial in leucorrhea, gleet, bleeding piles, and aphthæ. The decoction is made by boiling the root in water or milk, and its dose is from one to two fluidounces, three, four, or five times a day. Dose of the powder is from ten to thirty grains.

GERANIIN, is the concentrated extract of the root of Geranium. It possesses the astringent properties of the root in an eminent degree, not causing any dryness of the mucous surfaces with which it comes in contact, in which respect it differs from Tannic Acid. It has been employed with benefit in diarrhea, dysentery, summer-complaint, menorrhagia, colliquative diarrhea, etc. Combined with Capsicum and Ipecacuanha, it appears to increase their efficacy in uterine hemorrhage. The dose of Geranium is from one to five grains or more, repeated as required; it may be given in syrup, molasses, gruel, water or port wine.

GOSSYPIUM HERBACEUM.

COTTON.

A well-known annual plant, the inner bark of the root of which is emmenagogue, parturient, and abortive. A tincture of the bark in spirit of Nitric Ether, and administered in doses of from thirty to sixty drops, three, four, or five times a day, has produced the most decided and prompt relief in amenorrhea owing to a torpid condition of the uterus, or a mere derangement of its functions not connected with disease of other parts. It has likewise proved efficacious in cases of recent dysmenorrhea.

During labor, it will be found to excite uterine contractions when these are weak, and inefficient; and I have successfully used it in a few cases of uterine hemorrhage, in combination with Ergot and Cinnamon. (*Page* 457.)

A strong decoction of the bark may be made by adding four ounces of it to a quart of water, and boiling down to a pint; the dose is one or two fluidounces every twenty or thirty minutes. That this decoction will produce abortion is an undoubted fact, and it is much used by the female slaves of the South for this purpose, who, generally, take but one dose, about a pint of the strong decoction. It appears to effect the desired result without any injury to the general health. (*Page* 570.)

An extract is made from the bark, which forms an excellent emmenagogue, and which may be used in amenorrhea and dysmenorrhea in combination with Belladonna and Quinia. It may be advantageously added to Caulophyllin, Cimicifugin, Senecin, etc., in the treatment of uterine affections. The dose of the extract is from three to ten grains, three times a day.

HÆMASTASIS.

LIGATING THE EXTREMITIES.

Hæmastasis, is a term applied to the retention of venous blood in the extremities by ligatures. A handkerchief, or any suitable cord is to be tied around the upper part of the thighs, and the arms, and then by means of a piece of wood or other hard substance, is to be turned or twisted around so as to compress the veins sufficient to check the circulation of blood in them; care must be taken, however, not to check the circulation in the arteries, which may be known by the action of the pulse. In a short time the arms and legs will become much distended from an arrest of their venous circulation, and an amount of blood may thus be removed from the trunk and retained in the limbs, which the most heroic practitioner dare not remove by the lancet. Should the patient faint while under the influence of this operation, promptly loosen or remove the ligatures; if he be plethoric and of firm, vigorous constitution, he must be reduced by cathartics, diuretics, or sudorifics, and be under the influence of some mild nauseant, at the time of the operation.

This mode of reducing the amount of blood in the trunk is found very useful in uterine hemorrhage, puerperal convulsions, placenta prævia, in all operations where the consequences of uterine hemorrhage are to be feared, and whenever it is deemed advisable to lessen the amount of blood in the head and trunk, without injuring the system.

HEDEOMA PULEGIOIDES.

PENNYROYAL.

A well-known in retic
and emmenag

promote perspiration, restore suppressed lochia, and excite the menstrual discharge when recently checked; it is often used by females for this last purpose—a large draught being taken at bed-time, the feet having been previously bathed in warm water for fifteen or twenty minutes. A gill of brewer's yeast added to the draught is reputed a safe and certain abortive. The oil is sometimes employed for the criminal purpose of inducing abortion, but it is dangerous.

HELONIAS DIOICA.

HELONIAS.

Also known as *False Unicornroot*. It is an indigenous, perennial plant, the root of which possesses tonic properties. It also appears to exert an influence upon the reproductive organs, gradually removing any derangement of their functions, and giving to them tone and vigor. It has been advantageously used in leucorrhea, amenorrhea, dysmenorrhea, and in cases where there is a tendency to repeated and successive abortions. A medicated wine made of two ounces of Helonias, and one, each, of Pleurisy-root, and Blue Cohosh, to a quart of Wine, and given in wineglassful doses three times a day, has been found a superior remedy in many forms of uterine disease. The dose of the powdered root is, from twenty to forty grains, three times a day; of the decoction, from two to four fluidounces; of the hydro-alcoholic extract, which is an elegant preparation, from two to five grains. Practitioners must not confound this root with that of the Aletris Farinosa, for which it is frequently mistaken.

HEUCHERA AMERICANA.

ALUMROOT.

An indigenous, perennial plant, the root of which is powerfully astringent. In decoction with equal parts of Goldenseal and Blue Cohosh, it has proved beneficial in the diarrhea of parturient women, in diabetes, and in bleeding-piles, and as a local application in nursing sore-mouth, aphthous sore-mouth, and leucorrhea. Equal parts of Alum root and Black Cohosh in decoction, form a valuable local application in excoriation of the cervix uteri and also in vaginal leucorrhea. Internally, an aqueous extract will be found a very eligible form for administration. The dose of the decoction is from one to two tablespoonfuls three or four times a day; of the aqueous extract, from two to four grains.

HUMULUS LUPULUS.

HOPS.

A well-known plant, the cones or strobiles of which are extensively employed in medicine, steeped in hot water or vinegar, as a fomentation in inflammatory and painful affections, as in pleurisy, pneumonia, gastritis, enteritis, painful swellings or tumors, etc.: sometimes they are beneficially combined with other articles, as Boneset, Tansy, Stramonium, and several bitter herbs. In cases of wakefulness, a pillow stuffed with Hops has long been a popular remedy for procuring sleep. Two parts of Stramonium leaves and one of Hops, form a valuable application in salt-rheum, ulcers, and some painful tumors. Hops are seldom employed internally, though ale, beer, and porter, into the composition of which they enter largely, are frequently administered, for their stimulating, tonic, and nutritive powers, in cases of debility with no inflammatory symptoms.

LUPULIN, is a yellow, granular powder, secreted by the Hop-scales, and which is obtained by rubbing or thrashing the strobiles, and then sifting. As it rapidly loses its virtues by keeping, it should either be formed immediately into a tincture, or else the physician should supply himself with a fresh article every year. Owing to a neglect of this matter, many practitioners do not employ Lupulin, considering it nearly or quite inert.

Lupulin possesses tonic and hypnotic properties, allaying pain, relieving restlessness, and inducing sleep. It will likewise be found useful in after-pains, and to suppress sexual desires. In cases of wakefulness connected with nervous irritation, anxiety, or exhaustion, it will frequently be found valuable: its internal exhibition does not derange the stomach, nor cause constipation, as is the case with Opium. The following preparation forms an excellent remedy in after-pains, and in nervous irritability and wakefulness of parturient women:

℞. Lupulin, twelve grains,
Caulophyllin,
Scutellarin, of each, six grains. Mix.

Divide into six powders, and give one every two or three hours. Or, instead of powder, it may be formed into a similar number of pills. A mixture of oil of Chamomile one fluidrachm, ethereal oil of Lupulin one fluidrachm and a half, Sulphuric Ether half a fluidounce, has been found very useful in dysmenorrhea, and other painful affections of the uterus, in doses of from thirty to sixty drops, every three hours: it will likewise be of service in nervous headache, and in cases of great nervous excitability. The ethereal oil of Lupulin is made by forming a tincture with Ether and Lupulin, filtering, and allowing the Ether to evaporate spontaneously.

The dose of Lupulin is from two to ten grains, every one, two, or three hours, and which may be given in powder, or in pill by merely rubbing it in a warm mortar until it acquires a pilular consistence. The dose of the tincture is from one to four fluidrachms, in mucilage or sweetened water.

HYOSCYAMUS NIGER.

HENBANE.

A biennial plant, indigenous to Europe, but naturalized in the northern parts of this country. The leaves and seeds are the parts used. In large doses they are powerfully poisonous; in small ones they are anodyne and calmative, and are much used for allaying pain, soothing excitability, arresting spasm, and inducing sleep.

Henbane, unlike Opium, does not produce constipation, but has a tendency to act as a laxative; hence it is frequently given as a substitute for Opium in cases where constipation must be avoided, or where that drug disagrees. It may be exhibited in febrile and inflammatory affections, neuralgia of the uterus, nervous headache, and in cases of excessive nervous excitability. Added to Podophyllin, or other active cathartics, it will prevent tormina without impairing their energy.

In combination with Lupulin and Caulophyllin, it will frequently be found very efficacious in after-pains, and nervous irritability of the puerperal female. It is usually administered in the form of tincture, the dose of which is from half a fluidrachm to two fluidrachms, as often as required. The alcoholic extract is also an elegant form for administration: when properly prepared, it contains all the medicinal virtues of the plant, and may be given in doses of one-fourth of a grain two or three times a day, gradually increased to one or two grains, or until the desired influence is obtained. The fluid extract of this remedy is frequently prescribed in doses of from ten drops to a fluidrachm. It forms a durable and efficient preparation. A superior fluid-extract may be obtained of Tilden & Co., New York.

HYPERICUM PERFORATUM.

ST. JOHNSWORT.

An indigenous, perennial plant, the tops and flowers of which are the parts employed. They possess astringent, sedative, and diuretic properties, and have been successfully given in diarrhea, jaundice of children, hysteria, menorrhagia, and in depressed nervous conditions. Locally applied, in fomentation or in the form of an ointment, they are useful for dispelling hard tumors, caked breasts, bruises, ecchymosis, ulcers, etc.

I have successfully employed this article in congestion of the cervix, ecchymosis of the cervix, and erosion of the cervix. The tops and flowers having been coarsely bruised and steeped in hot water, are to be applied directly to the cervix, in the same manner as mentioned for a similar application of Arnica flowers on page 644.

From the happy results obtained from these agents in the diseases named, in my own practice, I cannot too highly recommend them to the profession: it is to be hoped that others will use them, and fully test their virtues in similar affections.

The dose of St. Johnswort, in decoction or infusion, is one or two fluidounces every hour or two.

IODINIUM.

IODINE.

This is an elementary, non-metallic body, principally obtained from sea-weeds. It possesses, in medicinal doses, alterative, diuretic, and emmenagogue properties, and is much employed in scrofula, bronchocele, syphilis, enlargement of the external absorbent glands, enlargement of the liver and spleen, breasts and uterus; in ovarian tumors, leucorrhea, amenorrhea, and dysmenorrhea. In chronic diarrhea and dysentery, obstinate cholera-infantum, and obstinate diarrhea of puerperal females, I have found the following a superior remedy:

℞. Iodine, twelve grains,
Geraniin, two drachms and two scruples,
Sulphate of Morphia, one grain,
Simple Syrup, a sufficient quantity to
form a pill-mass. Mix.

Divide the mass into eighty pills, of which one pill may be given to an adult, and repeated every hour or two. The same pill will be found applicable to many uterine diseases, by omitting the Geraniin and substituting Caulophyllin or Cimicifugin. Thus prepared, it will be found of much value in leucorrhea, amenorrhea, and engorgements of the uterus.

Iodine, when given internally to females, is apt to increase the quantity of the menstrual discharge, and sometimes to multiply the periods of its appearance: if the symptoms are not very severe or alarming, but little interference will be required, as they will cease after a short time; but where this is demanded, a cessation of the use of the remedy will most generally suffice.

I make extensive use of a preparation, in leucorrhea, amenorrhea, and other uterine difficulties, made by adding two fluidrachms of the tincture of Iodine to fourteen fluidrachms of the saturated tincture of Black Cohosh root. The dose is from twelve to eighteen drops, in a small quantity of water, three or four times a day. Although the dose of the Iodine, in this mixture, is not very large, yet the agent will be found to exert a prompt and most happy influence upon the disease.

The compound tincture of Iodine possesses all the medicinal virtues of the Iodine, and is at present more generally employed than the simple tincture, principally because it is less liable to decomposition. It is made as follows:

℞. Iodine, one drachm,
Iodide of Potassium, two drachms,
Alcohol, four fluidounces. Mix.

Dissolve the Iodine and the Iodide of Potassium in the alcohol. The dose of this tincture is five drops three times a day, gradually increased to thirty, if necessary.

The dose of Iodine in substance, is half a grain two or three times a day: it should be powdered, and made into pill-form by the addition of some inert substance; or, it were much better to add Opium or Morphia to it, in order to lessen its irritative action upon the stomach, and form into a pill with extract of Liquorice.

Dose of the simple tincture, from five to fifteen drops, two or three times a day.

IRIS VERSICOLOR.

BLUE FLAG.

An indigenous, perennial plant, the root of which possesses cathartic alterative, and diuretic properties. It may be administered with advantage in amenorrhea, and leucorrhea, either alone, or in combination with other agents which exert a direct influence upon the uterus. In obstinate affections of the reproductive organs, they may be frequently rendered susceptible to the influence of the remedies administered, by first salivating the patient, with a mixture composed of equal parts of Blue Flag root, Mandrake root, and Prickly-Ash bark; of which, from five to ten grains may be given every two or three hours (so as to fall short of catharsis), and which will act as a powerful alterative, causing a copious salivation without rendering the breath offensive, or injuring the teeth or gums. The dose of Blue Flag, in powder, is from five to twenty grains, of the saturated tincture, from ten to sixty drops.

IRIDIN, the oleo-resinous principle of Blue Flag, possesses the active properties of the root. Although not so prompt in its action as Podophyllin, yet I prefer it to that article, when conjoined with Cimicifugin, in many diseases of the uterus. Any harshness of action of Blue Flag root, or of Iridin may be lessened or removed entirely, by the addition of a few grains of Capsicum, or, Ginger, a half grain or a grain of Camphor, or, two or three grains of Caulophyllin, or, half a grain of extract of Hyoscyamus. Since the manufacture of Podophyllin, this agent has been unjustly neglected, and probably on account of its slowness of action; but by so doing, physicians deprive themselves of a most valuable medicine. The dose of Iridin, is from half a grain, to three or four grains.

JUNIPERUS SABINA.

SAVIN.

This is a well-known evergreen shrub, a native of Europe, and growing in this country. The tops and leaves are the parts used. They possess emmenagogue and abortive properties. A warm decoction is a popular remedy in some sections of the country, for suppression of the menses. It is likewise said to be useful in menorrhagia, and to prevent threatened abortion; but I am inclined to doubt such statements. It should never be given when much general or local inflammation exists, neither should it be used during pregnancy.

The oil of Savin, given two or three times a day, in doses of from ten to fifteen drops, on sugar, will, it is said, most certainly produce abortion; but it is a dangerous agent, apt to violently affect the stomach and bowels, and produce an inflammation of these organs terminating in death, as has been witnessed in many females who have taken it with this criminal intent.

The oil, has likewise been combined with oils of Tansy, Pennyroyal, and Hemlock, as an emmenagogue, in doses of from two to four drops; and in larger doses, to criminally produce abortion, but it is seldom given for this latter purpose, without destroying the female, or causing some painful and annoying symptom, which remains through life.

The following tincture has been highly recommended in amenorrhea:

℞. Tincture of Ergot,
Essence of Savin,
Tincture of Black Cohosh,
Tincture of Water Pepper, of each, one fluidounce. **Mix.**

The dose is a fluidrachm, two or three times a day.

In the administration of Savin, or its oil, too much care can not be observed, as it may produce fatal results. The dose of the powdered leaves, is from five to fifteen grains, three times a day; of the infusion, from half a fluidounce to two fluidounces.

The JUNIPERUS VIRGINIANA, or Red Cedar, is sometimes used as a substitute for the above, but it is less active.

KALMIA ANGUSTIFOLIA.

SHEEP LAUREL.

An indigenous shrub, the leaves of which possess sedative and astringent properties. They may be used in powder, or decoction, but the tincture is the best form for administration. It will be found very valuable in febrile and in inflammatory diseases, and hypertrophy of the heart, allaying all febrile and inflammatory action, and lessening the action of the heart. It may be employed with efficacy in cases of abortion caused by syphilitic taint, and may be given alone, or in combination with tincture of Black Cohosh, or tincture of Poke-root.

In active menorrhagia, it has proved decidedly beneficial, by combining one part of the tincture of Kalmia with four of the tincture of

Cinnamon, and administering the mixture in doses of from twenty to forty drops, every two or three hours.

In palpitation of the heart, connected with hypertrophy of that organ, prompt relief will frequently be obtained from the following compound:

℞. Tincture of Musk,
Tincture of Kalmia.
Sulphuric Ether,
Essence of Cinnamon, of each, one fluidrachm. Mix.

The dose is from ten to thirty drops, three times a day.

The dose of Sheep-Laurel leaves, in powder, is, from ten to thirty grains, two or three times a day; of the decoction, from half a fluidounce to a fluidounce; and of the tincture, from ten to twenty drops. As large or improper doses will produce vertigo, dimness of sight, great depression of the action of the heart, and cold extremities, much care must be observed when using it; ceasing its use for a few days, or diminishing, the dose, when these symptoms appear. Its poisonous effects are best overcome by alcoholic stimulants, with counter-irritation to the spine and extremities.

KRAMERIA TRIANDRIA.

RHATANY.

A South American plant, the root of which is a powerful astringent. The tincture has been used with much advantage in passive menorrhagia, leucorrhea, uterine hemorrhage, and in the diarrhea of puerperal females. It is likewise useful in the summer-complaint of children. In uterine hemorrhage, it has been beneficially added to other agents, as tincture of Ergot, tincture of Cinnamon, etc. The dose of the tincture of Rhatany, is from one to four fluidrachms, repeated three or four times a day. An extract is sometimes prepared from it and given in doses of from ten to twenty grains.

LEONURUS CARDIACA.

MOTHERWORT.

A well-known exotic, but extensively growing in this country. The tops and leaves are emmenagogue, nervine, antispasmodic, and, in some cases, laxative. It is most commonly prescribed in warm infusion, in menstrual suppression from colds, and in deficient or suspended lochia. In this last difficulty I have found it superior to any other remedy.

The hydro-alcoholic extract possesses emmenagogue, nervine, and antispasmodic properties, and may be given in the nervous diseases of women, in painful affections peculiar to females, in irritable habits, and in amenorrhea. It may be advantageously combined with Asclepidin, Cimicifugin, Scutellarin, etc., in female difficulties. The dose of the extract is from three to six grains, every two, three or four hours; of the decoction, from two to four fluidounces.

The leaves and tops steeped in hot water, may be used as a fomentation over the abdomen, in suppressed or painful menstruation, and in suspended lochia.

LIGUSTRUM VULGARE.

PRIVET.

An indigenous shrub, the leaves of which are astringent. A decoction of them is valuable in long-standing summer-complaints, in the diarrhea of puerperal females, and as a local application in leucorrhea, ulceration of the bladder, and ulcers of the mouth and throat. The dose of the powdered leaves, is from thirty to sixty grains, three times a day; of the decoction, from two to four fluidounces.

LOBELIA INFLATA.

LOBELIA.

A well-known indigenous plant, the leaves and seeds of which, are the parts used in medicine. It possesses active emetic properties, but it is seldom used for this purpose in obstetric practice; being more generally employed on account of its relaxant, sedative, and antispasmodic influences. And for these purposes it is administered in the form of the officinal preparation, compound tincture of Lobelia and Capsicum, the formula for which is as follows:

℞. Lobelia,
Capsicum,
Skunk-Cabbage root, of each in powder, one ounce,
Alcohol one pint. Mix.

Macerate for fourteen days, express, and filter.

This preparation is a most powerful relaxant and antispasmodic, and is highly efficacious in cramps, spasms, convulsions, tetanus, rigidity of the os uteri, hour-glass contraction, etc. In convulsions and tetanus, it may be poured into the corner of the mouth, and repeated as often as necessary; generally, the effect is almost instantaneous. In rigidity of the os uteri, a fluidrachm administered by mouth, or double the quantity by enema into the rectum, and repeated, if necessary, in fifteen or twenty minutes, will be found to produce a state of softness and dilatability without the necessity of using the lancet, so highly recommended by many authors. Used in this latter mode, as an injection, it will frequently arouse the uterus to contract energetically, without the use of Ergot or any other parturient agent.

The dose of the tincture is from half a fluidrachm to a fluidrachm every ten or twenty minutes, or as often as the urgency of the case requires. In the hysterical convulsions occurring during pregnancy, and in puerperal convulsions, a much larger dose will frequently be required, as a tablespoonful, or half a fluidounce. Every accoucheur should make this one of the principal remedies with which he provides himself.

An infusion of Lobelia, made by digesting three or four drachms of the powdered herb in a pint of boiling water, will be found very useful when used in injection, in relieving and arresting the false pains frequently met with previous to labor; in overcoming rigidity of the os uteri, as well as of the perineum; in rendering the irregular and spasmodic contractions of the uterus during labor, normal and active; and in relieving the headache, and other premonitory symptoms of puerperal convulsions which are sometimes met with. It will likewise be found to induce speedy delivery in those instances where delay is owing to want of uterine nervous energy.

Lobelia may be used for many other purposes with advantage; as a nauseant and expectorant in croup, pneumonia, laryngitis, pertussis, catarrh, etc., for which purpose it may be given in doses of from five to twenty grains. Sometimes it is combined with Bloodroot, Senega, Squill, or other nauseants.

In the early stages of fever, it may be exhibited with benefit, as it relaxes the system, modifies arterial excitement, and produces diaphoresis, thus tending to equalize the circulation, and assisting the vital powers to eliminate morbid matters.

In the diseases of infancy, as cough, croup, pertussis, bronchitis, asthma, etc., the compound tincture of Lobelia is much employed; it is made thus:

℞. Lobelia, herb,
Bloodroot,
Skunk-Cabbage root,
Wild Ginger root,
Pleurisy-root, of each, coarsely powdered, one ounce,
Alcohol, three pints. Mix.

Macerate for fourteen days, express, and filter.

This tincture may be used to produce emesis, or merely to nauseate; in croup, pertussis, and bronchitis its emetic influence should be first produced, and afterward only its nauseating. As an emetic, it may be given in doses of from half a fluidrachm to half a fluidounce, according to the age of the child, the above doses ranging between those of six months old and ten years. It may be given in molasses, and should be repeated every ten or fifteen minutes, until vomiting is produced, aiding its action by the administration of warm water, warm infusion of Boneset, or Chamomile flowers.

As an expectorant, the dose is from five drops to sixty, given in some infusion of Elm-bark, or flaxseed; the bowels must be kept regular in all instances.

The oil of Lobelia, though sometimes prescribed internally, is better adapted for external use, as, if care be not observed, it is apt to occasion, inflammation of the stomach. In the cramps and painful affections of the extremities, during pregnancy, the following liniment will be found a valuable application:

℞. Oil of Amber,
Oil of Sassafras, of each, half a fluidounce,
Oil of Lobelia, a fluidrachm,
Ethereal oil of Capsicum, half a fluidrachm. Mix.

This may be applied to the affected parts, two or three times a day, and, if it proves too severe, it may be reduced in strength by the addition of one or two fluidounces of Olive oil.

Dose of the powder of Lobelia, as an emetic, from twenty to sixty grains; of the tincture, from two to four fluidrachms.

MARUTA COTULA.

MAYWEED.

A well-known plant, the flowers of which are emetic, tonic, emmenagogue, and antispasmodic. As an emetic it is given in warm infusion freely; as a tonic, the cold infusion is employed in doses of from half a fluidounce to two fluidounces, three or four times a day. The warm infusion is frequently used in recent amenorrhea, and with decided efficacy. An aqueous extract may be made from the flowers, which will be of service in the sick-headache of females, in convalescence from exhausting diseases, in the anorexia of pregnancy, and as a tonic and antispasmodic, in all cases where these influences are indicated.

The recent plant bruised and applied to the skin, will cause vesication, and the sores heal readily.

The fresh leaves of Mayweed and Water Pepper, equal parts of each, bruised, and moistened with a small quantity of Spirits of Turpentine, form a powerful epispastic.

MEL.

HONEY.

Honey is nutritious, antiseptic, diuretic, and demulcent, and is much used in urinary and pulmonary affections, and as an addition to injections, lotions, gargles, etc. A very excellent and palatable preparation for coughs, especially during febrile or inflammatory attacks, is made as follows:

℞. Honey,
Olive oil,
Spirits of Nitric Ether,
Lemon juice, of each, one fluidounce. Mix.

The dose is from half a fluidrachm to a fluidrachm, to be repeated several times a day, or when the cough is very severe.

A tincture of Honey-bees is highly recommended by some practitioners in diseases of the bladder and kidneys, as well as in some uterine affections. It is prepared by placing a quantity of the living bees in a vial, agitating the [illegible] as to irritate them, and while in this condition cover [illegible] a few days the tincture will be ready f[illegible]nty drops, repeated three or four times a day. It is asserted that if employed too freely, or if its use be too long continued, it will cause abortion in the pregnant female.

MITCHELLA REPENS.

PARTRIDGEBERRY.

An indigenous evergreen herb, which possesses diuretic, astringent, and parturient properties. It is chiefly used for its tonic and alterative influence upon the uterus, and is beneficial in all derangements of the functions of this organ, as amenorrhea, dysmenorrhea, leucorrhea, etc. The squaws are said to drink a decoction of this plant for several weeks previous to their confinement, for the purpose of rendering parturition safe and easy, and which is undoubtedly effected through the tonicity imparted to the uterus by it.

It is principally employed in the officinal preparation, compound syrup of Partridgeberry, or Mother's Cordial, which is prepared as follows:

℞. Partridgeberry, one pound,
Helonias root,
High Cranberry bark,
Blue Cohosh root, of each, four ounces.

Grind and mix the articles together; place the whole pound and three-quarters in a convenient vessel, cover them with fourth-proof Brandy, and macerate for three days. Then transfer the whole to a displacement apparatus, and gradually add Brandy, until three pints of spiritous tincture have been obtained, which reserve. Then continue the displacement with hot water until the liquid passes tasteless; add to this two pounds of refined sugar, and evaporate by a gentle heat to five pints; remove from the fire, add the reserved three pints of spiritous tincture, and flavor with essence of Sassafras, or Wintergreen.

This preparation is employed in all cases where the functions of the internal reproductive organs of the female are deranged, as in amenorrhea, dysmenorrhea, menorrhagia, leucorrhea, and to overcome the tendency to habitual abortion. The dose is from two to four fluidounces, three times a day. Pregnant females, especially those of a delicate or nervous habit, will find it an advantage to take one or two doses daily, for several weeks previous to parturition, as, by the energy it imparts to the uterine nervous system, the labor will be very much facilitated; beside which, it frequently removes the cramps to which some females are liable during the latter weeks of utero-gestation.

The following is highly recommended as a cure for sore nipples: Take two ounces of the fresh herb Partridgeberry, add to it a pint of water, and make a strong decoction; then strain, add as much good cream as there is liquid of the decoction, and gently boil the whole down to the consistence of a soft salve. When cool it is fit for use. The nipple is to be anointed with it every time the child is removed from the breast.

NEPETA CATARIA.

CATNIP.

A common and well-known herb, the tops and leaves of which are carminative and diaphoretic, when employed in warm infusion; and tonic, when used cold. The warm infusion is much used in febrile diseases as a diaphoretic, and to promote the action of other diaphoretics, as well as to allay spasmodic action, and induce sleep; it has also proved decidedly beneficial in amenorrhea, dysmenorrhea, nervous headache, hysteria, and nervous irritability, and as a carminative and antispasmodic in the flatulent colic of children. The expressed juice of the herb, given in doses of a tablespoonful two or three times a day, is a superior remedy in amenorrhea, frequently restoring the menstrual secretion after other means have failed. A fluid extract of Catnip, Valerian, and Scullcap, forms an excellent remedy for the cure of nervous headache, restlessness, and many other nervous symptons. The infusion of catnip may be drank as freely as the stomach will permit, in all cases.

OLEUM TEREBINTHINÆ.

OIL OR SPIRITS OF TURPENTINE.

This agent is employed for various purposes: thus, from its influence in diminishing excessive mucous discharges, it has been advantageously exhibited in chronic catarrh, chronic diarrhea, chronic dysentery, chronic inflammation of the bladder, and leucorrhea, in which cases it may be given in doses of from five drops to half a fluidrachm every three or four hours. In menorrhagia and uterine hemorrhage, it acts as a most efficacious astringent, in doses varying from twenty minims to a fluidrachm, according to the urgency of the symptoms, and repeated every hour or two, as required: it may be given in Cinnamon-water, decoction of Rhatany, or other aqueous astringent preparation. When used in the form of enema, it has proved successful in cases of amenorrhea arising from torpor of the uterine vessels, and in tympanitic distension of the abdomen. From half a fluidounce to two fluidounces may be suspended in half a pint of water, or some mucilaginous liquid, by means of two yelks of egg, injected into the rectum, and retained there for some time. One part of oil of Turpentine, added to three or four parts of Castor Oil, forms an ordinary remedy for worms in children.

Warren's Styptic Balsam, has been used with uniform success for a period of nearly thirty years in the treatment of hemorrhages, requiring no confinement to the room, nor any especial auxiliary treatment. In hemoptysis, epistaxis, hematemesis, and menorrhagia, it affords prompt relief. It is made as follows:—Place Sulphuric Acid, five drachms by weight, in a Wedgewood mortar, and slowly add to it oil of Turpentine two fluidrachms, stirring it constantly with the pestle; then add, in the same manner, Alcohol two fluidrachms, and continue stirring until no more fumes arise, when it may be bottled, and should be stopped with a ground-glass stopper. It should be prepared from the purest materials, and when made should exhibit a dark but clear red color, like dark-blood; but if it be a pale, dirty red, it will be unfit for use. After standing a few days, a pellicle forms upon the surface of the balsam, which should be broken and the liquid below it used. If in well-stopped bottles, age does not deteriorate it. The dose is forty drops, to be used as follows: Into a common-sized teacup put a teaspoonful of brown sugar, thoroughly incorporate the forty drops by rubbing together, and then slowly stir in some water until the cup is nearly full, when it should be immediately swallowed. The dose may be repeated every hour for three or four hours, and its use should be discontinued as soon as fresh blood ceases to flow.

OSMUNDA REGALIS.

BUCKHORN BRAKE.

A beautiful indigenous fern, the root of which possesses tonic and mucilaginous properties. It is very valuable in leucorrhea and other female weaknesses, and is much employed in the treatment of rickets.

One root, infused for half an hour in a pint of hot water, will convert the whole into a thick jelly, which may be sweetened, and flavored with ginger, cinnamon, brandy, etc., if not contra-indicated,—the dose of which is from two to four fluidounces three or four times a day. The mucilage will also be found valuable in cough, diarrhea, and dysentery, and as a tonic during convalescence from exhausting diseases.

PAPAVER SOMNIFERUM.

POPPY.

Opium is the concrete juice of the unripe capsules of the poppy plant, and is much employed in the practice of medicine to fulfill various indications according to circumstances, as sedative, antispasmodic, diaphoretic, and febrifuge. In combination with Ipecacuanha, as in the compound powder of Ipecacuanha and Opium, or in the compound tincture of Virginia Snakeroot, it is employed as an anodyne and diaphoretic, in all febrile, inflammatory, and painful affections, as well as in cases of nervous irritability, morbid vigilance, restlessness, hysteria, spasmodic action, and increased mucous secretions. It is frequently useful, in one of the above preparations, in false pains, after-pains, and rheumatism of the uterus, or it may be given alone for the same purpose. Combined with Capsicum and Ipecacuanha, it forms a very valuable remedy in cough, and hemorrhages, especially uterine hemorrhage. It has been given alone, to arrest too powerful action of the uterus during labor, but it does not always effect the desired result. In dysmenorrhea it has sometimes afforded relief, when added to Ergot and Camphor. Indeed, it may be advantageously used in all cases where an anodyne-diaphoretic is indicated; where there exists an excessive mucous secretion; where the functions of the uterus have been recently disturbed from exposure, as in suspended or checked lochia, or suppressed menstruation; where severe pain is present, and in spasmodic affections generally. It is contra-indicated where there is a great amount of inflammatory excitement, until this is somewhat reduced; where there exists a strong determination of blood to the head; where there is a deficient secretion from inflamed mucous surfaces; generally, in constipation, and where it produces those phenomena known as the idiosyncratic action of Opium.

Opium is employed internally in the form of powder, pill, or tincture: its dose, in substance, is from one-fourth of a grain to three grains, according to its influence upon the patient, and the indication to be fulfilled. The medium dose to procure sleep and ease pain, is one grain; sometimes larger quantities are necessary, as in tetanus, severe pain, etc. The dose of the tincture (*Laudanum*) is from ten to sixty drops. When it cannot be taken by mouth, it may be made to produce its influence on the system by injecting it into the rectum, about twice the quantity required by mouth being used, and added to a small quantity of water, starch-water, or elm mucilage.

Its various salts of Morphia possess similar properties, and are generally employed as substitutes, the dose of either being from one-eighth of a grain to half a grain, in powder, pill, or solution. Sulphate of Morphia is more commonly used in this country, a solution of which may be made by dissolving eight grains of the Sulphate of Morphia in eight or ten drops of Elixir of Vitriol, and about a fluidrachm of Alcohol, and then adding half a pint of distilled water. The dose of this solution, for an adult, is from half a fluidrachm to two fluidrachms: one fluidrachm contains about one-eighth of a grain of the sulphate.

An overdose of Opium, or any of its salts, may be treated by emetics of Mustard and Lobelia-seed, with strong coffee, stomach-pump, external counter-irritation, cold applications to the head and spine, forced exercise, galvanism and artificial respiration. As soon as consciousness is once fairly restored, an active cathartic, with forced exercise to a moderate extent, generally completes the cure.

PODOPHYLLUM PELTATUM.

MANDRAKE.

An indigenous, perennial plant, frequently known by the name, *May-apple.* The dried root is emetic, cathartic, alterative, anthelmintic, emmenagogue, hydragogue, and sialagogue. It is frequently used with advantage in bilious, typhoid, and puerperal fevers, as a cathartic or emeto-cathartic, frequently breaking up the disease at once; and is likewise employed in hepatic affections, answering a purpose which renders it superior to any mercurial preparation. It has been found very beneficial in dysmenorrhea, amenorrhea, and leucorrhea, in which it is usually administered with Black Cohosh, Blue Cohosh, or other uterine tonic. The dose of the powdered root, as a cathartic, is from ten to thirty grains; as a sialagogue and alterative, from three to ten grains. Of the tincture, from ten to sixty drops act as a cathartic, and from five to twenty drops, as an alterative and sialagogue.

PODOPHYLLIN, is the name given to the resinous principle obtained from the Mandrake: it possesses the properties of the root in a superior degree, and is extensively employed wherever an active cathartic is required, as well as to fulfill several of the indications for which mercurials are recommended and used. Beside its cathartic effect, it exerts an emmenagogue influence, which renders it frequently serviceable in amenorrhea: in the following form it has been found especially serviceable in this affection:

℞. Podophyllin, five grains,
Carbonate of Iron,
White Turpentine, of each, ten grains. Mix.

Divide the mass into ten pills, the dose of which is one pill three or four times a day. In dysmenorrhea it may be frequently added to the medicines exhibited, with decided benefit; thus, the following has proved useful in obstinate dysmenorrhea, attended with a discharge of membranous shreds:

℞. Podophyllin, five grains,
Ergot, one scruple,
Camphor, two scruples. Mix.

Divide into ten powders, of which one is a dose, and may be repeated twice a day. It will be found more advantageous when given to females of full, plethoric habits. Half a grain of Podophyllin, added to one or two grains of the inspissated juice of Conium Maculatum, and made into a pill, will also be found useful in dysmenorrhea; one pill may be given two or three times a day.

In leucorrhea, the following pill, in combination with vaginal injections of a decoction of Black Cohosh and Geranium-root or Tannic Acid, has effected prompt and permanent cures:

℞. Cimicifugin, one scruple,
Leptandrin, ten grains,
Podophyllin, two and a half grains. Mix.

Divide into ten pills or powders, of which one is a dose, and which is to be repeated two or three times a day. To form the above into a pill-mass, either simple Syrup, or mucilage of Gum Arabic, in sufficient quantity, must be added.

As a cathartic, Podophyllin will in many instances prove valuable in puerperal fever, phlegmasia dolens, puerperal phrenitis, and puerperal mania. Its tendency to produce irritation and pain of the stomach or bowels, may be obviated by combining it with Caulophyllin, Castile Soap, Ginger, Alkalies, or extract of Hyoscyamus, and it should be remembered that the action of the resin is very much increased by thoroughly triturating it with Loaf Sugar, Sugar of Milk, Ginger, Caulophyllin, or other soluble substance.

In very small doses, and triturated with Leptandrin and Sugar of Milk, it will be found a superior remedy in the various attacks of summer complaint to which children are subject, especially in those cases attended with a determination of blood to the head and accompanying torpor of the liver.

In cases of hepatic torpor, or when this is connected with other affections common to females, in dysentery, and constipation, the following pill will be useful:

℞. Leptandrin, half a drachm,
Podophyllin, fifteen grains,
Extract of Rhubarb, one drachm. Mix.

Divide into thirty pills, the dose of which is from one to three pills, once or twice a day.

The dose of Podophyllin is from one-eighth of a grain to one grain, repeated as the case requires. It is frequently added to Cimicifugin, Caulophyllin, Senecin, Aletridin, etc., in female diseases attended with constipation, or derangement of the hepatic functions; in cases of pregnancy, it should be administered with great caution. With those persons in whom the smallest doses of Podophyllin produce nausea, or griping, or other unpleasant symptoms, Iridin will be found an efficient substitute.

POLYGONUM PUNCTATUM.

WATER PEPPER.

A well known annual plant, also recognized by the name of *Smart Weed.* The whole herb is medicinal, and possesses stimulant, diaphoretic and emmenagogue properties. The infusion, prepared in cold water, has been successfully used in amenorrhea, dysmenorrhea, and in deficient lochial discharge; it is likewise stated to form a valuable local application in the sore-mouth of nursing women. The dose of the infusion is from two to four fluidounces, three or four times a day.

The tincture of Water Pepper, made by macerating the fresh herb in Holland gin, or proof spirit, has also been successfully exhibited in the above maladies, as well as in moderate menorrhagia; it is said to cause a warmth and a peculiar tingling sensation throughout the system, with slight aching pains in the hips and loins, and a sense of weight and tension within the pelvis. The dose is from one to four fluidrachms, three times a day.

The extract of Water Pepper is a very neat form in which to exhibit the remedy, it possesses all the properties of the plant, and may be substituted for its infusion or tincture, in all cases. The following pill, in which it enters, has been successfully administered in obstinate amenorrhea:

℞. Podophyllin, eight grains,
Cimicifugin,
Dried Sulphate of Iron,
Extract of Water Pepper, of each, twenty-four grains,
Oil of Savin, twenty minims. Mix.

Divide the mass into twenty-four pills, the dose of which is one pill, three times a day.

The dose of the extract of Smart Weed is from two to ten grains, three times a day.

POLYGONUM FAGOPYRUM, or common Buckwheat, may be used to recall the flow of milk in the breasts of nurses, where it has disappeared for several days. Any amount of buckwheat flour is to be stirred in a sufficient quantity of Buttermilk to form a poultice, which is then to be merely warmed, and applied over the whole breast; in five or six hours it may be renewed. Sometimes it requires to be thus used for three or four days in succession, before its effects will be produced; generally, however, twenty-four hours will be sufficient.

POLYTRICHUM JUNIPERUM.

HAIR-CAP MOSS.

An indigenous perennial plant, which, employed in infusion, has a powerful diuretic influence. It may be used in plethora, in all cases, where depletion by diuresis is desired, in urinary obstructions, in febrile and inflammatory diseases, and in dropsical affections. It possesses but little smell or taste, and never produces any nausea or disagreeable sensation in the stomach. In doses of two fluidounces of the infusion, repeated every half hour, it has been known to remove from a dropsical patient from twenty to forty pounds of water in the space of twenty-four hours. It is sometimes combined with Marshmallows, or other diuretic agents, where a demulcent effect is desired, but its diuretic properties are not increased by the combination.

POTENTILLA CANADENSIS.

FIVE-FINGER.

A perennial plant, common to the United States, which possesses tonic and astringent properties. A decoction of the plant has been found beneficial in febrile diseases, diarrhea of children and puerperal females, night-sweats, excessive lochial discharge, and in menorrhagia; also as a local application in ulcerated mouth and throat, and for spongy, bleeding gums. The dose of the decoction, is from two to four fluidounces, three or four times a day.

PTERIS ATROPURPUREA.

ROCKBRAKE.

An indigenous perennial fern, possessing astringent and anthelmintic properties. A decoction, made by adding four drachms of the plant to a pint of boiling water, and given in half fluidounce doses, repeated every two or three hours, has been used successfully in diarrhea and dysentery; it has also proved useful in night-sweats, menorrhagia, and excessive lochial discharge; also as a local application in ulcerations of the mouth and fauces, and as a vaginal injection in leucorrhea. A strong decoction has been successfully employed as a remedy for worms.

PTEROSPORA ANDROMEDA.

CRAWLEY.

A rare and singular perennial plant, indigenous, the root of which possesses prompt and powerful diaphoretic virtues. It has been successfully exhibited in febrile and inflammatory diseases. Combined with Caulophyllin, it forms an excellent agent in amenorrhea and dysmenorrhea; and is unsurpassed in after-pains, suppression of lochia, and the febrile symptoms which sometimes occur at the parturient period.

A very valuable diaphoretic may be made as follows:

℞. Crawley,
Pleurisy-root, of each, ten grains,
Bloodroot, three grains,
Ipecacuanha, one grain. Mix.

Divide into two powders, one of which may be administered every hour or two. In some cases, the addition of nitrate of Potassa, three or four grains to each dose, will render the powder more promptly efficacious.

The scarcity and high price of Crawley, has prevented it from coming into general use. Its dose is from twenty to thirty grains of the powdered root, given in water, tea, cider, or lemonade, (as may be allowed), as warm as the patient can drink, and repeated every hour or two according to circumstances.

PYRETHRUM PARTHENIUM.

FEVERFEW.

A common perennial plant, possessing emmenagogue, carminative, and vermifuge properties. The warm infusion is an excellent remedy in recent cold, worms, flatulency, suppressed menstruation, suppression of lochial discharge, and in hysteria. A teaspoonful of the compound spirits of Lavender forms a valuable addition to the dose of the infusion, in hysteria, and flatulency. The dose of the infusion is from two to four fluidounces, every one, two, or three hours. The leaves applied as a fomentation, are useful in severe pain or swelling of the bowels.

RUBIA TINCTORIUM.

MADDER.

A native of the south of Europe, the root of which is supposed to possess emmenagogue and diuretic properties. Thirty grains of the powdered root [illegible] ar times a day, is the dose; this has been [illegible] ne practitioners, combined with one [illegible] reputed success. However, it is [illegible] confidence in its action.

RUBUS STRIGOSUS.

RED RASPBERRY.

RUBUS TRIVIALIS.

DEWBERRY.

RUBUS VILLOSUS.

BLACKBERRY.

These are well known plants, which possess considerable medicinal virtues. The leaves of the red Raspberry, in infusion or decoction, are strongly astringent, and have been found an excellent remedy in diarrhea, cholera-infantum, relaxed conditions of the intestines of children, and passive menorrhagia; they are also said to exert an influence over the uterus during parturition, exciting its contractions when other agents have failed, and have been found serviceable in after-pains. As a local application, the decoction has been found beneficial in leucorrhea and prolapsus uteri. The dose of the decoction is from one to four fluidounces, several times a day; it is frequently combined with equal parts of Black Cohosh and Blackberry roots. The syrup of Raspberry, in water, forms a refreshing and beneficial beverage for fever patients, and during convalescence.

Dewberry, and Blackberry roots, are used principally on account of their astringency. They may be given in decoction, in the same doses as that of the Raspberry, or from twenty to thirty grains of the powdered bark of the root. They will be found very efficacious in diarrhea, passive menorrhagia, excessive lochial discharge, and in the summer complaints of children. Blackberry-jam is well adapted to cases of diarrhea, dysentery, and cholera-infantum; also in diarrhea during typhoid and other fevers.

RUTA GRAVEOLENS.

RUE.

A well known perennial plant, the leaves of which possess emmenagogue, anthelmintic, and antispasmodic properties. The warm decoction or infusion is a popular remedy in recent amenorrhea, and in suppression of the lochial discharge. It excites a special action upon the uterus, and when improperly administered is capable of exciting menorrhagia, inflammation of the intestines and uterus, and, in pregnant females, miscarriage. The oil of Rue, has been taken with the criminal intention of producing abortion, and has been almost invariably followed by dangerous symptoms, as gastro-intestinal inflammation, and cerebral derangement, sometimes terminating fatally.

It has, however, been used successfully in hysteria, flatulent colic, nervous excitability, and in worms; but should never be given to pregnant females, or those subject to large floodings, or menorrhagia. The dose of the powdered leaves is from ten to twenty grains; of the decoction, from one to four fluidounces.

SANGUINARIA CANADENSIS.

BLOODROOT.

An indigenous, perennial plant, possessing expectorant, alterative, and emmenagogue properties. It is seldom employed in obstetrical practice, though it has been found useful in amenorrhea, and in female difficulties connected with hepatic torpor. In these latter instances, it may be advantageously added to Caulophyllin, Senecin, Cimicifugin, or whatever uterine remedy may be prescribed.

Bloodroot formed into a tincture with elixir of Vitriol, or diluted Sulphuric Acid, is an excellent remedy for many cutaneous diseases, as ringworm of the scalp, scaldhead, tetter, ringworm, etc.

Ten to twenty grains of the powdered root, or from twenty to sixty drops of the tincture, will act as an emetic; from three to five grains of the powdered root, may be used as a stimulant, expectorant, or emmenagogue; and from half a grain to two grains, as an alterative. *Sanguinarin*, a principle obtained from the root, and supposed to contain its alkaloid and resinoid principles, has been found very efficacious in amenorrhea, dysmenorrhea, and other functional disorders of the female generative system, in combination with equal parts of Caulophyllin, and the alcoholic extract of Cimicifuga.

SARRACENIA PURPUREA.

SARRACENIA.

An indigenous, perennial plant, commonly known as the *Sidesaddle flower*. Its virtues are not fully ascertained. Equal parts of Sarracenia, Blue Cohosh, and Buckhorn brake, in the form of syrup, have been found very useful in chlorosis, amenorrhea, and other uterine derangements, in the dose of one or two fluidounces, three or four times a day. An infusion of the leaf, or root, is also efficacious in amenorrhea, dysmenorrhea, and other functional derangements of the uterus, connected with a sluggish or torpid condition of the organ. The dose of the powdered root, is from twenty to thirty grains, three or four times a day; of the infusion, from one to three fluidounces.

SCUTELLARIA LATERIFLORA.

SCULLCAP.

An indigenous, perennial herb, possessing tonic, nervine, and antispasmodic properties. It has been found especially beneficial in chorea, convulsions, and nervous affections generally, attended with excitability, restlessness, or wakefulness. In the cases of children whose healths are impaired by teething, it has been given with advantage. As there is no danger in using the article, the powder or infusion may be taken freely. It is sometimes combined with Blue Cohosh or Black Cohosh, in cases of nervous headache, nervous irritability, or mental excitement of females, and especially when these conditions exist during pregnancy or at the time of labor. Messrs. Tilden & Co., of New York, prepare an elegant fluid extract from this herb, which contains all its active properties. I have referred to these gentlemen in several previous instances, and I have done so in order that our practitioners may be led to use their preparations, which they may rely upon as pure and unadulterated articles,—a fact which, in these times of imposition and adulteration, it is very important to become acquainted with. They prepare quite a number of extracts, etc., from our indigenous plants, and take great pains to present the very best articles to the profession: it is but an act of justice to them, and of duty to the profession, to speak thus strongly in relation to their manufactured extracts, fluid extracts, etc. Our Messrs. W. S. Merrell & Co., H. H. Hill & Co., and T. V. Thorpe, of this city, enter more largely into the manufacture of the pure and reliable concentrated preparations, while Tilden & Co. have thus far confined themselves principally to extracts and fluid extracts.

SCUTELLARINE, is the concentrated preparation obtained from Scull-cap. According to Prof. Cleaveland, it is prepared as follows: "A tincture of the herb is made with diluted Alcohol, and then the alcohol is distilled off until the residue is of the consistency of molasses, when this is mixed with several times its weight of Water, and then precipitated with alum, or some other soluble salt. The precipitate is freed from the salt used in precipitation, by one or two washings in water, and dried; and while it is not chemically pure, it is sufficiently so as to be of great use in medicine. The green color of the powder is owing to the *chlorophylle*, or coloring-matter, not having been separated from the precipitate; and if the chlorophylle be possessed of no medicinal virtue, it acts simply as an adulterant in the compound.

"As far as this has been tested chemically, it has manifested neither acid nor alkaline reaction, and as it is not a resin, it is classed among the neutral principles with salicine."

This is one of our most valuable nervines and tonics, and is especially useful in cases of depression of the nervous and vital powers after sickness, over-exercise, excessive study, or from long-continued and exhausting labors. One grain will frequently produce its quiet and soothing effect, controlling nervous agitation, and inducing a sensation of calmness and strength.

Scutellarine has been advantageously combined with Cypripedin, Cimicifugin, and Caulophyllin, in various female difficulties, both in the pregnant and non-pregnant condition, accompanied with an excitable or irritable condition of the nervous system. Its dose is from one to five grains three or four times a day, though an increased quantity will not be productive of any unpleasant effects.

SECALE CORNUTUM.

ERGOT.

Ergot is diseased rye, upon the grains of which a fungus growth occurs, and which is named Ergotætia Abortifaciens. Ergot is used in medicine principally on account of its power of promoting uterine contractions in languid natural labors. The contractions caused by it are very unlike those observed in the natural parturient process, being strong and continuous, and of a spasmodic character, without any periods of relaxation: in consequence of this continued pressure exerted upon the child, and especially when the parts are not sufficiently soft and yielding, it is generally more or less injured, and frequently destroyed. As sufficient reference has been made to its use in labor on pages 325, 326, I will omit any further observations relative thereto at this place. (*See note on page* 669.)

It is sometimes administered to facilitate abortion, when it has once commenced and cannot be checked. (*See pages* 177, 178.)

In uterine hemorrhage, both during the gravid and non-gravid state, Ergot has frequently been administered to check it, and it has likewise been advised in retained placenta, mole, hydatids, a clot of blood, etc., to expel these when the organ has once commenced acting. In painful dysmenorrhea, accompanied with membranous shreds, it has frequently proved beneficial when given in combination with Camphor.

It is sometimes prescribed in amenorrhea, but this is improper, because if given in sufficient doses to produce a discharge, permanent injury may be inflicted upon the female.

The ethereal oil of Ergot may be prepared by forming an ethereal tincture, and evaporating the ether. It possesses the properties of Ergot, while the oil by expression does not. As a parturient, it may be given in doses of from twenty to fifty drops, in water, tea, or some aromatized syrup.

The dose of powdered Ergot, in the ordinary affections for which it is recommended, is from five to fifteen grains three times a day; but its use should not be continued for any great length of time, on account of its tendency to cause dangerous symptoms. As a parturient, it is generally given in doses varying from one to two drachms: my usual mode of exhibiting it, in order to arouse uterine contractions, is to place a drachm or two in about four fluidounces of hot water, and give a tablespoonful every ten minutes, until the pains are induced or become active, and which generally occurs in from twenty to thirty minutes, and frequently much sooner.

The tincture of Ergot may be used as a substitute for the article, in substance, in all cases where this is indicated or desired: the dose is one or two fluidrachms. A fluid extract has been prepared from Ergot which possesses the virtues of the article, is pleasant to the taste, and acts promptly without nausea. Its dose is from half a fluidrachm to a fluidrachm, being equal to one or two full parturient doses of the powder.

SENECIO GRACILIS.

FEMALE REGULATOR.

This is an indigenous, perennial plant, the root and herb of which, together with those of Senecio Aureus, *Life-root*, exert an especial influence upon the female reproductive organs. In amenorrhea, not connected with some structural lesion, it has proved very efficacious, used alone in infusion, or combined with equal parts of Savin and Canada Snakeroot. In dysmenorrhea, it has also proved valuable, in which difficulty it is frequently combined with Aletris Farinosa. An infusion of Cinnamon, Raspberry leaves, and Senecio, has been found very serviceable in menorrhagia, to be administered both at the time of the discharge, and during the intervals. The dose of the decoction or infusion, is from two to four fluidounces, three or four times a day. A fluid extract, prepared from the plant, forms a very useful agent in amenorrhea, and other uterine diseases, in doses of from half a fluidrachm to a fluidrachm, three or four times a day; it may also be advantageously used in combination with the fluid extract of Water Pepper, Black Cohosh, etc.

SENECIN, is the concentrated preparation obtained from Senecio Gracilis. It possesses the virtues of the plant in a high degree, and may be employed in all the uterine derangements in which the plant is used.

A very valuable pill, in uterine difficulties, is made as follows:

℞. Caulophyllin, two scruples,
Senecin,
Extract of Water Pepper, of each, one scruple. Mix.

Divide the mass into twenty-five pills, the dose of which is one, to be repeated three times a day.

In chlorosis, with amenorrhea, the following pill has been used, and with much efficacy:

℞. Dried sulphate of Iron, two scruples,
Senecin,
Aletridin, of each, one scruple. Mix.

Divide the mass into twenty-five pills, the dose of which is one, to be repeated three times a day.

In menorrhagia, senecin has been advantageously combined with Geraniin; or its ethereal tincture may be administered, with benefit, in some astringent infusion. Equal parts of Senecin, inner bark of Cotton root, and Cinnamon bark, made into a tincture, have likewise been successfully exhibited in this affection.

In dysmenorrhea, benefit has been derived from the use of the following pill:

℞. Camphor, two and a half drachms,
Sulphate of Quinia,
Extract of Belladonna, of each, one scruple,
Senecin, a quantity sufficient to form a pill-mass.

Mix, adding a few drops of Alcohol, if the senecin be too hard, and divide the mass into eighty pills. The dose is two pills every hour during the menstrual period, until the pain ceases, and one pill, three or four times a day, in the intervals.

The dose of Senecin, is from one to three, or five grains, three times a day.

SODÆ BORAS.

BORATE OF SODA.

Commonly known as *Borax*. Its medicinal actions are not perfectly understood. It undoubtedly exerts an influence upon the uterus, and has been successfully administered in amenorrhea, dysmenorrhea, to facilitate parturition, or to aid in the expulsion of the placenta. In such instances it has been used alone, or combined with other agents, as Cinnamon, Ergot, Blue Cohosh, etc. In doses of ten grains, repeated three or four times a day, it has produced abortion, attended with pains all over the system, and excessive debility of the joints, which remained for several months, in a greater or less degree; on this account, its administration to pregnant females is improper. The dose of Borax, as an emmenagogue, is from ten to thirty grains, dissolved in water, or in infusion of Elm or Flaxseed.

A solution of Borax is frequently employed as a beneficial local application to inflamed and sore nipples, pruritus vulva, and aphthous ulcerations of the mouth and fauces.

SPIRIT VAPOR BATH.

A Spirit Vapor-Bath exerts a most powerful, yet beneficial influence upon the whole system, aiding very materially our endeavors to remove disease. This highly valuable mode of producing activity of the cutaneous vessels, has long been practiced in many sections of the country as a domestic remedial agent, and was first introduced to the notice of the medical profession by myself, about nineteen years ago, since which it is in much use among physicians. The advantages to be derived from this method of producing perspiration are very great, and it is not followed with any of those injurious consequences which often attend the internal administration of a sudorific.

It is to be given as follows: The patient is undressed, ready for getting into bed, having removed the shirt and underclothing worn through the day, and puts on a night-shirt or other clothing to be worn only while sweating, and during the night, if the bath is taken at bedtime. He is then seated on a high Windsor, or wooden-bottomed chair, or instead thereof, a bench or board may be placed on a common open bottomed chair, care being taken that the bottom is so covered that the flame will not burn him; after seating himself, a large blanket or coverlid is thrown around him from behind, covering the back part of his head and body, as well as the chair, and another must be passed around him in front, which last is to be pinned at the neck, loosely, so that he can raise it and cover his face, or remove it down from his face from time to time, as occasion requires, during the operation of the bath. The blankets must reach down to the floor, and cover each other at the sides, so as to retain the vapor and prevent it from passing off.

This having been done, a saucer, or tin vessel, into which is put one or two tablespoonfuls of whisky, brandy, spirits, alcohol, or any liquor that will burn, is then placed upon the floor, directly under the center of the bottom of the chair, raising a part of the blanket from behind to place it there; then light a piece of paper, apply the flame to the liquor, and as soon as it kindles let down the part of the blanket which has been raised, and allow the liquor to burn till it is consumed, watching it from time to time to see that the blankets are not burned; as soon as consumed, put more liquor into the saucer, about as much as before, and again set it on fire; being very careful to pour no liquor into the saucer while the flame exists, as there would be danger of burning the blankets, patient, and perhaps the house.

Continue this until the patient sweats or perspires freely, which in a majority of cases will be in five or ten minutes.

If during the operation the patient feels faint or thirsty, cold water must be sprinkled or dashed in his face, or he may drink one or two swallows of it—and in some cases, the head may be bathed with cold water.

As soon as free perspiration is produced, wrap the blankets around him, place him in bed, and cover him up warm, giving him about a pint of either good tea, ginger, or some herb tea to drink, as warm as he can take it. After two or three hours, remove the covering, piece by piece, at intervals of twenty or twenty-five minutes between each, that he may gradually cease perspiring.

There is no danger of taking cold after this Spirit Vapor-Bath, if the patient uses ordinary precaution; and if his disease will allow, he can attend to his business on the next day the same as usual. In fact, the whole is a very easy, safe, agreeable, and beneficial operation, much more so than a mere reading of the above explanation would lead one to suppose.

This bath, which is more properly a *hot-air bath*, is very useful in colds, and all febrile and inflammatory attacks, whenever it can be employed by the patient. It will be found very valuable in recent amenorrhea, and dysmenorrhea, and sometimes in suspended lochia, and some of the febrile or inflammatory attacks during the puerperal period; it has likewise been recommended in cases of rigid os uteri. In these latter instances, it should be used with prudence.

STATICE CAROLINIANA.

MARSH ROSEMARY.

An indigenous, perennial, maritime plant, the root of which is powerfully astringent, and has been employed in infusion or decoction, in diarrhea and dysentery. The decoction is principally employed, however, as a local application in leucorrhea, prolapsus uteri, prolapsus ani, and aphthous ulcerations of the mouth and throat. The dose of the decoction is one or two fluidounces, every one, two, three or four hours.

TANACETUM VULGARE.

TANSY.

A well known plant, possessing tonic, diaphoretic, and emmenagogue properties. The cold infusion is tonic, and is frequently used in jaundice, dyspepsia, flatulency, and worms. The warm infusion is useful in recent amenorrhea, tardy labor-pains, and suspended or deficient lochia. Used as a fomentation to the bowels, the herb has been useful in inflammatory conditions of the abdominal viscera, in amenorrhea, and in painful dysmenorrhea.

Oil of Tansy has been used with efficacy as a vermifuge, but is seldom administered on account of its bitterness. It has also been employed criminally to produce abortion, but almost always with fatal results.

The dose of Tansy, dried and powdered, is from thirty to sixty grains, two or three times a day; of the infusion, from one to four fluidounces; of the oil, as a vermifuge, from two to five drops.

TRILLIUM PENDULUM.

BETH-ROOT.

An indigenous, perennial plant, the root of which possesses tonic and astringent properties. It has been used with benefit in menorrhagia, uterine hemorrhage, leucorrhea, and bleeding-piles; also in diarrhea and dysentery. It may be given in doses of one drachm of the powdered root, or from two to four fluidounces of the strong infusion. Equal parts of Trillium, Geranium, and Cimicifuga, have been used internally, in infusion, and as a local application in obstinate leucorrhea, and with efficacy.

VALERIANA OFFICINALIS.

VALERIAN.

A European plant, the root of which is extensively used as a tonic, and antispasmodic. It is of service in all cases of irregular nervous action, as in the morbid wakefulness of fevers, in the irritability and restlessness occurring in hysterical constitutions, in chorea, hysteria, etc.

When used in powder, the dose is from half a drachm to a drachm, three or four times a day; in infusion, which is less liable to irritate the alimentary canal, from one to two fluidounces. It may be frequently combined, in infusion, with Scullcap, Skunk-Cabbage, and Pleurisy-root, with advantage; and, in chorea, with Black Cohosh.

The fluid extract, which holds the virtues of the root in a concentrated form, may be given two or three times a day, in doses of one or two fluidrachms. It may likewise be advantageously added to other fluid extracts, as of Black Cohosh, Senecio, Pleurisy-root, Ladies-slipper-root, etc. The Messrs. Tilden & Co., prepare an alcoholic extract from Valerian root, which appears to possess all the properties of the crude article; I have employed it alone, and in union with Scutellaria, Caulophyllin, etc., in female d[illegible]

The oil of Valerian is frequently substituted for the above forms of preparation, in doses of four or five drops. The following forms an efficacious preparation for nervous, hysterical, and sleepless cases:

℞. Tincture of Lupulin,
Tincture of Hyoscyamus, of each, two fluidounces,
Camphor, one drachm,
Oil of Valerian, eleven minims. Mix.

The dose is one or two fluidrachms, two or three times a day. Another preparation, of a somewhat like character, has been employed for a similar purpose:

℞. Ethereal oil of Lupulin, one fluidrachm,
Oil of Valerian, half a fluidrachm,
Camphor, one drachm.

Mix together, and dissolve the Camphor in the oils; the dose is from five to ten drops, on sugar, or in mucilage, two or three times a day.

VERATRUM VIRIDE.

AMERICAN HELLEBORE.

An indigenous, perennial plant, the root of which possesses sedative properties when given in small doses. A saturated tincture of the recent root has been employed to produce diaphoresis, and to reduce the force and frequency of the pulse, which it has sometimes brought as low as thirty-five beats in a minute. It has been successfully employed in neuralgic and rheumatic affections, in typhoid fever, puerperal fever, morbid irritability, chorea, spasmodic affections, and other instances where a sedative influence has been desirable. It has been used with excellent results in some of the febrile and inflammatory affections to which the puerperal female is subject. In large doses it is emetic, and produces, when too long continued, or in improper quantities, faintness, vertigo, somnolency, headache, dimness of vision, and dilated pupils.

The dose to an adult, is eight drops, in sweetened water, repeated every three hours, increasing each dose one or two drops, until nausea, vomiting, or a reduction of the pulse to sixty-five or seventy ensues; then reduce the dose one half. Any unpleasant effects arising from its administration may be speedily relieved by Brandy, tincture of Ginger, or Laudanum.

VERNONIA FASCICULATA

IRON-WEED.

An indigenous, perennial plant, common to the Western States. The root, in powder or decoction, has been found beneficial in amenorrhea, dysmenorrhea, leucorrhea, and menorrhagia. It appears to exert a tonic influence upon the uterus. The dose of the powdered root, is from twenty to thirty grains, three or four times a day; of the decoction, one or two fluidounces; of a saturated tincture, from half a fluidrachm to two fluidrachms.

VIBURNUM OPULUS.

HIGH CRANBERRY.

An indigenous shrub, common to the Northern States, the bark of which is a powerful antispasmodic, and hence is more generally known as *Cramp-bark.* It is very useful in relieving spasms and cramps of all kinds, especially those to which pregnant females are subject. A decoction or wine of the bark, used during pregnancy, will, it is said, prevent any attacks of cramp, hysteria, etc., and also render the female less disposed to puerperal convulsions, or irregular uterine contractions, during labor. These preparations may be used in doses of two fluidounces, two or three times a day.

The hydro-alcoholic extract will be found a very valuable preparation, and may be used in all cases in which the bark is indicated. In uterine difficulties, it may be beneficially combined with Caulophyllin, Cimicifugin, Aletridin, Senecin, Asclepidin, etc. In bilious and flatulent colic, spasmodic pains of the stomach and bowels, its combination with Dioscorein, will be found advantageous. The dose of the extract, is from one to five grains, three times a day.

INDEX.

ABDOMEN, enlargement of, Page 101
  laxity of, 159
  rigidity of, 159
  subsidence of, 229
Abdominal palpation, 107
Abdominal pregnancy, 133
Abnormally large pelvis, 31, 344
Abortion, 166
  causes of, 167
  diagnosis of, 171
  hemorrhage during, 174, 175
  prognosis of, 172
  symptoms of, 170
  treatment of, 174
Abscess, mammary, 608
Accidental hemorrhage, 446
  diagnosis of, 447
  treatment of, 448
Accoucheur, conduct of, during the first stage of labor, 241
  conduct of, during the second stage of labor, 253
  conduct of, during the third stage of labor, 260
Acute tympanites, 606
Adherent placenta, 465, 472
Adherent placenta in hour-glass contraction, 468
Affections of the bladder during pregnancy, 150
After-pains, 272
After-treatment of hemorrhage, 460
Agglutination of the os uteri, 336
Alimentation of the child, 279
  artificial, 279
Allantois, 193, 207
Alvine evacuations of the child, 268, 278
Amnion, 189
Amniotic fluid, Page 190
Amnii liquor, 190
  excess of, 307
Anæsthesia, 400, 401
Anorexia during pregnancy, 141
Anterior commissure of the vulva, 55
Anterior lip of os uteri, retention of, 320
Anteversion of the uterus, 163
Antidotes to gelseminum, 314, 315
Anus, prolapsus of, 157
Aorta, compression of, by Prof. C. D. Meigs, 457
Aphthæ, 628
  symptoms of, 628
  treatment of, 629
Apoplexy, 492
  fetal, 262
Application of the bandage, 265
  blunt hook, 516
  forceps, 531
  perforator, 553
Arch of pubes, 16
Areola, in pregnancy, 100
Arm, presentation of, 285, 392
Articulations and ligaments of pelvis, 16
Ascites of the fetus, 331
Asphyxia, fetal, 261
Attention to the bowels, 242, 249, 273
  to the urine, 242, 249, 251, 273, 306
  required during the puerperal state, 270
  required subsequent to labor, 270
Attentions to the child, 262, 278
Attitude of the fetus, 213
Audible signs of pregnancy, 103
Auscultation in pregnancy, 108
Axis of the inferior strait, 24
  of the pelvis, 24

Axis of the superior strait, 23

Bag of waters, 235
  to distinguish from fetal scalp, 247
Ballottement, 108
Bandage, application of, 265
Bark of cotton-root, 308, 456, 570
Bastinadoing, 506
Baudelocque's pelvimeter, 41
Beating of fetal heart, 104
Bed, putting to, 266
Bladder, affections of, 150
  calculus in, 333
  descent of, 331
  rupture of, 488
  treatment of ruptured, 489
Blastodermic vesicle, 187
Blood, effects of loss of, 312, 401, 462
Blunt hook, 516
Body of the uterus, changes in during pregnancy, 113
Bones of the fetal head, 46
  of the pelvis, 10
Bowels, attention to, 242, 249, 278
Breasts, enlargement of, 100
  inflammation of, 608
Breathing, difficult, during pregnancy, 152
Breech, how to distinguish, 381
Breech-labors, management of difficult, 390
Breech-presentation, 286, 381
  management of, 386
  positions of, 286, 383
Brim o the pelvis, 14, 22
Broad ligaments, 72
Brow presentation, 362
Bruit de souffle, 103

Caducous membrane, 184
Cesarean operation, 556
  cases in which it may be used, 557
  dangers of, 557
  mode of performing, 558
  when to be performed, 557
Cesarean section, 556
Calcaneo-iliac positions, 287
Calcaneo-pubal position, 287
Calcaneo-sacral position, 287
Calcined deer's horn, in hemorrhage, 457
Calculus in the bladder during labor, 333
  during pregnancy, 166
Cancer of the os uteri, 336
Caput succedaneum, 238, 291, 302
Cardialgia during pregnancy, 143
Carunculæ myrtiformes, [illegible]
Carus, curve of, [illegible]
Cases for turning, [illegible]
Cases in which the Cesarean operation may be performed, [illegible]
Cases requiring craniotomy, [illegible]
Cases requiring forceps, [illegible]
Catarrh, nasal, [illegible]
Catheter, 57, 124, 162, 251, [illegible] 305, [illegible]
Cauliflower tumor, [illegible]
Cause of labor, [illegible]
Causes of abortion, [illegible]
  of phlegmasia dolens, [illegible]
  of puerperal fever, [illegible]
  of puerperal mania, [illegible]
  relaxation and separation of the symphyses, [illegible]
Cautions respecting the use of ergot, [illegible]
Cavities of the pelvis, 10, [illegible]
Cavity of the decidua, [illegible]
Cazeaux on diagnosis of placenta prævia, [illegible]
Cephalæmatoma, [illegible]
Cephalalgia during pregnancy, [illegible]
Cephalic version, 405, [illegible]
  Prof. Wright's, [illegible]
Cephalo-iliac positions, [illegible]
  diagnosis of, [illegible]
Cervix uteri, [illegible]
  changes in the, [illegible]
  fibrous tumors of the, [illegible]
Changes in the body of the uterus during pregnancy, [illegible]
Changes in the cervix uteri during pregnancy, [illegible]
Changes in the properties of the uterus during pregnancy, [illegible]
Changes in the uterus during pregnancy, [illegible]
Character of labor, determined, [illegible]
Child, apoplexy of, [illegible]
  ascites of, [illegible]
  asphyxia of, [illegible]
  attentions to the, [illegible]
  delivery of the, [illegible]
  diseases of, (*see Infants.*)
  food for the, [illegible]
  holding the, [illegible]
  washing the, [illegible]
Child-bed fever, [illegible]
Children, plurality of [illegible]
  still-born, [illegible]

Child's head, delay of in the pelvic cavity, 334
Chin from the breast, departure of, 362
Chloroform, 400, 444, 471, 506
Chorion, 188
Cicatrix in the vagina, 335
Circulation, fetal, 215
Classification of labors, 233
Cleaveland, Prof. C. H., on placenta prævia, 439
Cleaveland on phlegmasia dolens, 592
  placental forceps, 516
Clitoris, 56
Coccyx, 13
Cold douche, 493, 502
Colic of infants, 623
Collection of feces in the rectum, 333
Colostrum, 268
Commissures of the vulva, 55
Complicated labor, 425
Compound pregnancy 96, 416
  presentations, 377
Compression of the aorta, 457
Concealed hemorrhage, 446
  diagnosis of, 447
  treatment of, 448
Conception, 88
Condition of the female in the first stage of labor, 234
  in the second stage of labor, 237
Condition of the os uteri, in the first stage of labor, 235
  in the second stage of labor, 237
Condition of the uterus in the first stage of labor, 235
  in the second stage of labor, 237
Conduct of accoucheur during the first stage of labor, 241
  during the second stage of labor, 253
  during the third stage of labor, 260
Constipation during pregnancy, 144
  of infants, 624
Contraction, hour-glass, 468
  irregular, 306, 468
Contractions, fibrillar, 230
  painless uterine, 230
  uterine, 227, 271
Convulsions, apoplectic, 492
  during pregnancy, 146
  epileptic, 493
  hysterical, 146, 492
  puerperal, 491
Cord, around the neck, 257, 329
  cutting umbilical, 260
  hemorrhage from, 625
  umbilical, 199
  umbilical around the neck, 257, 329
  umbilical, dressing the 267
  prolapsus of the, 412
  umbilical, rupture of the, 474
  umbilical, shortness of the, 329
  umbilical, tying of, 260
Corpus Luteum, 78
  by Prof. C. D. Meigs, 81
Coryza, 634
Cotton-root, inner bark of, 308, 456, 570
Cough during pregnancy, 152
Coutouly's pelvimeter, 42
Cramp of the stomach during pregnancy, 144
Cramps during pregnancy, 158
Cramps during labor, treatment of, 254
Craniotomy, 549
  cases requiring, 551
  dangers of, 553
  mode of operating, 553
Cross-birth, 392
Crotchet, 552
Crural phlebitis, 590
Crusta lactea, 632
Curve of carus, 25
Cutting the umbilical cord, 260
Cyanosis, 620
  symptoms of, 620
  treatment of, 621
Cystocele, vaginal, 331

Dangers of Cesarean operation, 557
  of turning, 512
Davis' forceps, 520
Death of the fetus, 224
Decapitation, 404
Decidua, cavity of the, 184
  vera, 184
  reflexa, 184
  serotina, 185
Deciduous membrane, 184
Deficient contractions, 306
  lochial discharge, 276
Deformities of the pelvis, 28, 343
  management of in labor, 345
Delay of child's head in pelvic cavity, 334

Delivery in natural labor, position for, - - - - - - 254
Delivery of the child, - - 238, 257
  of the placenta, - - 239, 263
Departure of chin from the breast, - 362
Descent of the head, - - - 291
  of the os uteri, - - - - 320
Despondency during pregnancy, - 153
Detachment of placenta, - 451, 466, 471
Determining the character of labor, 248
Development of the fetus, - - 200
  of the human ovum, - - 183
Diagnosis of abortion, - - - 171
  of accidental hemorrhage, - 447
  of breech presentation, - - 381
  of concealed hemorrhage, - 447
  of ear presentation, - - 375
  of face presentation, - - 368
  of feet presentation, - - 391
  of hour-glass contraction, - 469
  of inflammation of the uterine appendages, - - - 578
  of intestinal irritation, - - 606
  of inverted uterus, - - - 480
  of knee presentation, - - 391
  of left occipito-anterior position, 289
  of left occipito-posterior position, 296
  of occipito pubal position, - 296
  of occipito-sacral position, - 301
  of pelvic presentations, - 381
  of phlegmasia dolens, - - 595
  of placenta prævia, - - - 428
  of prolapse of the cord, - - 413
  of puerperal convulsions, 492, 498
  of puerperal mania, - - 602
  of puerperal peritonitis, - - 577
  of right occipito-anterior position, 294
  of right occipito-posterior position, 300
  of rupture of the uterus, - - 486
  of shoulder presentations, - 393
  of transverse presentations, - 411
  of twins, - - - - 128, 417
  of uterine phlebitis, - - 581
  of vertex presentations, - - 288
Diameters of the fetal head, - - 48
  of the inferior strait, - - 23
  of the pelvic cavity, - - - 24
  of the superior strait, - - 22
Diarrhea after delivery, - - - 608
  during pregnancy, - - - 142
Diet after labor, - - - - 269
Differences of male and female pelvis, 26
Difficult breathing during pregnancy, 153
Difficult labor, - - - 303, 378
  ergot in, - - - - 306, 325
  from agglutination of os uteri, 336
  from ascites of the fetus, - 331
  from cancer of the os uteri, - 336
  from cauliflower tumor, - - 336
  from cicatrix in the vagina, - 335
  from distension by twins, - 307
  from early departure of the chin, - - - - - - 363
  from encysted tumors, - - 342
  from excess of liquor amnii, - 307
  from excrescences, - - - 342
  from exostosis, - - - 338
  from feces in the rectum, - 333
  from fibrous tumors of the cervix, - - - - - - 339
  from fungous tumor, - - 342
  from hydrocephalus, - - 330
  from imperforate hymen, - 334
  from imperforate os uteri, - 336
  from inefficient uterine contractions, - - - - 306, 323
  from malpositions of the head, 362
  from obliquity of os uteri, - 319
  from obliquity of uterus, - 319
  from œdema of labia majora, - 334
  from ovarian tumor, - - 340
  from pelvic deformity, - - 343
  from pelvic osteo-sarcoma, - 338
  from pelvic tumors, - - 337
  from phlegmonous tumors, - 342
  from polypus, - - - - 339
  from premature rupture of the membranes, - - - 321
  from rheumatism of the uterus, 309
  from rigidity of membranes, - 320
  from rigidity of os uteri, - 311
  from rigidity of soft parts, 316, 328
  from scirrhous tumors, - - 342
  from shortness of the cord, - 329
  from syphilitic vegetations, - 342
  from toughness of membranes, 320
  from tumors, - - - - 337
  from tympanitis of the fetus, - 331
  from vaginal cystocele, - - 331
  from vaginal hernia, - - 333
  from vaginal vesicocele, - 331
  in first stage, - - - - 303
  in second stage, - - - 322
  breech, management of, - - 390

Dilatation of os uteri, 231, 235, 248, 253, 315, 328
  of os uteri by dry-cupping, 328
  of perineum, 236
Dimensions of the fetus, 46, 218
Dimness of vision during pregnancy, 151
Discrimination of scalp from bag of waters, 247
Diseases of the fetus, 223
  of the pregnant female, 135
Distension from twins, 307
Divisions of labor, 233
  of the fetus, 46
Dr. Washington on dry-cupping, 328
Dressing the cord, 267
Dropsy of ovum, 166
Dry-cupping to cause dilatation of os uteri, 328
  to cause uterine contraction, 328
Duration of first stage of labor, 237
  of labor, 227
  of pregnancy, 93
  of second stage of labor, 239
  of third stage of labor, 239
Duties of accoucheur, after delivery, 265
  of accoucheur in the first stage of labor, 241
  of accoucheur in the second stage of labor, 253
  of accoucheur in the third stage of labor, 260
Dwarfish pelvis, 32, 344
Dyspnœa during pregnancy, 152

Ear presentations, 374
  diagnosis of, 376
  management of, 375, 377
  positions of, 375
  treatment of, 375, 377
Early departure of the chin from the breast, 362
Eclampsia, 491
Effects of gelseminum, to overcome, 314, 315
  of loss of blood, 312, 401, 462
Embryonic spot, 77, 188
Embryotomy, 549
Embryotomy forceps, Meigs, 556
Encysted tumors, 342
Enlargement of the abdomen, 101
  of the breasts, 100
Ephelis, 99
Ephemeral fever, 612
  symptoms of, 612
  treatment of, 613
Epigenesis, theory of, 86
Epilepsy, 493
Ergot, cautions respecting the use of, 326
  in difficult labors, 308, 325
  in natural labors, 259
Evolution, spontaneous, 402
  theory of, 86
Examination, vaginal, 242
Excavation, 24
Excess of liquor amnii, 307
Excessive lochial discharge, 276
Excoriated nipples, 277
Excoriation of the navel, 625
Excrescences, 342
Exhaustion, symptoms of, 323, 447, 529
Exostosis, 338
Expulsion of the head, 257
  of the placenta, 263
Extension, 52, 292
External organs, 53
Extra-uterine pregnancy, 96, 130
Exvisceration, 404

Face presentation, 284, 366
  diagnosis of, 368
  mechanism of, 369
  positions of, 285, 369
  treatment of, 372
Fainting, 151
Falling of the womb, 160, 281
Fallopian tubes, 73
False pains, 232
  treatment of, 232
False pregnancy, 96
False waters, 164
Fecal accumulation, 333
Fecundation, 84
Feet, how to distinguish, 391
Feet presentation, 287, 381
  diagnosis of, 391
  treatment of, 386–392
Female in natural labor, 234
  organs of generation, 53
Fetal apoplexy, 262
  asphyxia, 261
  circulation, 215
  dimensions and weight, 218
  head, diameters of, 48
  head, expulsion of, 286

- Fetal heart, beating of, 104
  - respiration, 215
  - scalp, to discriminate from bag of waters, 247
- Fetus and its development, 200
  - ascites of, 331
  - attitude of, 213
  - death of, 224
  - diseases of, 223
  - its divisions and dimensions, 46
  - position of, 213
  - tympanitis of, 331
  - violent movements of, 165
- Fever, ephemeral, 612
  - irritative, 179
  - miliary, 614
  - milk, 277
  - puerperal, 572
- Fibrillar contractions, 230
- Fibrous tumors of the cervix, 339
- Fifth position of vertex, 283, 300
- Fillet, 513
- First left cephalo-iliac position, 285, 393
  - diagnosis of, 393
- First position of vertex, 283, 289
- First right cephalo-iliac position, 285, 393
  - diagnosis of, 393
- First stage of labor, 234, 242
  - condition of female in, 234
  - condition of os uteri in, 235
  - condition of uterus in, 235
  - conduct of accoucheur in, 241
  - duration of, 237
  - inefficient contractions in, 306
  - management of, 242
  - mode of examination in, 243
  - rheumatism of uterus in, 309
  - rigidity in, 311
- Flatulent colic of infants, 623
- Fleshy moles, 129, 174
- Flexion, 51, 290
- Flooding, (*see Hemorrhage.*)
- Fluid, amniotic, 190
- Fontanelles, and sutures, 47
- Food for the child, 279
- Forceps, 518
  - at the superior strait, 526, 543, 547
  - cases requiring, 525
  - Cleaveland's placental, 516
  - Davis', 520
  - Hodges', 521
  - in breech labors, 547
- Forceps in face presentations, 544
  - in left mento-iliac positions, 545
  - in left occipito-anterior positions, 536
  - in left occipito-posterior positions, 538
  - in left occipito-transverse positions, 541
  - in mento-pubic positions, 546
  - in mento-sacral positions, 546
  - in occipito-posterior positions, (breech labors,) 548
  - in occipito pubic positions, (breech labors,) 548
  - in occipito-pubic positions, 537
  - in occipito-sacral positions, 540
  - in pelvic presentations, 547
  - in right mento-iliac positions, 545
  - in right occipito-anterior positions, 537
  - in right occipito-posterior positions, 540
  - in right occipito-transverse positions, 542
  - in vertex presentation, 536
  - mode of applying, 531
  - period for applying, 528
  - rules for applying, 526, 531
  - use of the, 525
  - when not to be used, 527
  - when the face is at the superior strait, 547
  - when the head is at the superior strait, 543
- Forehead toward pubic arch, 301, 364
- Fossa navicularis, 59
- Fourchette, 55
- Fourth position of vertex, 283, 296
- Frænum, 55
- Fungous tumor, 342
- Funis, ligature of, 260
  - prolapse of, 412
  - short, 329
  - umbilicalis, 199

- Galvanic heat in inverted uterus, 484
- Galvanism, in premature labor, 570
- Gastrodynia, during pregnancy, 144
- Gastrotomy (*see Cesarean operation.*)
- Gelseminum in abortion, 176
  - in cramps, 144
  - in gastrodynia, 144
  - in hour-glass contraction, 472

Gelseminum in inverted uterus, - 483
    in irregular contraction, - 472
    in irritative fever, - - - 476
    in odontalgia, - - - 149
    in placenta prævia, - - 434
    in preternatural labor, - - 400
    in puerperal convulsions, - 500
    in puerperal fever, - - - 583
    in puerperal mania, - - 604
    in retained placenta, - - 476
    in rheumatism of the uterus, 165, 311
    in rigid os uteri, - - - 314
    in vomiting, - - - 140, 231
    inert, - - - - 315, 500
    to overcome the effects of, 314, 315
General signs of pregnancy, - - 98
Genitals, itching of, - - 150, 154
    pustules of, - - - - - 160
Germinal membrane, - - 77, 187
    spot, - - - - - - 77
    vesicle, - - - - 77, 202
Gestation, duration of, - - - 93
Graafian vesicles, - - . - 75
Great sacro-sciatic ligament. - - 18

Habit of aborting, - - - - 179
Hand-presentation, - - - 285
Hand and foot presentation, - - 378
Hare-lip, - - - - - - 627
Head and extremity presenting, - 377
    delay of, in pelvic cavity, - 334
    descent of, - - - - 291
    extension of, - - - 52, 292
    flexion of, - - - 51, 290
    impaction of, - - - 357, 528
    mal-positions of, - - - 362
    of child, diameters of, - - 48
    positions of, (*see Vertex.*)
    presentation of. (*see Vertex.*)
    presentations of side of, - - 374
    restitution of, - - - 257, 293
    rotation of, - - - 52, 291
Headache, during pregnancy, - - 145
Heart, beating of fetal, - - - 104
    palpitation of, - - - 151
Heartburn during pregnancy, - 143
Heat, galvanic in inverted uterus, - 484
Hematemesis, - - - - 160
Hemoptysis, - - - - - 160
Hemorrhage, accidental, - - - 446
    accidental, diagnosis of, - - 447
    accidental, treatment of, - - 448

Hemorrhage, after effects of, - - 462
    after placental delivery, - - 452
    after placental delivery, symptoms of, - - - - 453
    after placental delivery, treatment of, - - - - 455
    after the child's delivery, - 450
    after treatment of, - - - 460
    before full term, - - - 426
    concealed, - - - - - 446
    concealed, diagnosis of, - - 447
    concealed, treatment of, - - 448
    following abortion, - - - 177
    from the cord, - - - 625
    from the navel, - - - 625
    from placenta prævia, treatment of, 431
    in retained placenta, - - 450
    in retained placenta, treatment of, 450
    prevention of, - - - - 461
    puerperal, - - - 425, 464
    reaction of, - - - - 462
    syncope from, - - - 437, 459
    treatment of after-effects, 460
    unavoidable, - - - - 426
    uterine, - - - - 425, 464
    with abortion, - - - 166
    with adherent placenta, - 450, 472
    with hour-glass contraction, - 469
    with inverted uterus, - - 478
    with irregular contraction, - 469
    with placenta prævia, - - 426
Hemorrhoids, - - - - - 156
Hernia, - - - - - - 166
    umbilical, - - - - - 624
    vaginal, - - - - - - 333
Hodge's forceps, - - - - 521
Holding the child, - - - - 262
Hollow of the sacrum, - - - 10
Hour-glass contraction, - - 468
Hydatids, - - - - - - 129
Hydrocele of infants, - - - 626
Hydrocephalus, - - - - 380
Hydrorrhea, - - - - - 164
Hymen, - - - - - - - 58
Hymen, imperforate, - - - 334
Hysterical convulsions, - - 146, 492
Hysteritis, - - - - - 579

Ilio-pectineal line, - - - 14
Ilium, - - - - - - - 13
Impaction of the head, - - 357, 528
Imperforate hymen, - - - 334

- Imperforate os uteri, - - - 336
- Impregnation, theories of, - - 83
- Incontinence of urine, - - - 160
- Indications of mal-formed pelvis, - 39
- Indication of premature labor, - 560
- Inertia of the uterus, - - - 452
- Inefficient action of the uterus in the
  - first stage of labor, - - 306
  - in the second stage of labor, - 323
- Inert gelseminum, - - 315, 500
- Infantile affections, - - - 620
- Infants, (*see Child.*)
  - colic of, - - - - - - 623
  - constipation of, - - - 624
  - hydrocele of, - - - - 626
  - jaundice of, - - - - 622
  - ophthalmia of, - - - - 622
  - retention of urine in, - - 622
  - swelled breasts of, - - - 626
- Inferior strait, - - - - - 23
  - axis of, - - - - - - 24
  - diameters of, - - - - 23
  - plane of, - - - - - - 24
- Inflammation of the breasts, - - 608
  - symptoms of, - - - - 609
  - treatment of, - - - - 610
- Inflammation of the uterine absorbents, 581
  - post-mortem appearances of, - 582
  - symptoms of, - - 581
- Inflammation of the uterine appendages, 578
  - diagnosis of, - - - - 578
  - post-mortem appearances of, - 578
  - symptoms of, - - - 578
- Inflammation of the uterine veins, 580
  - post-mortem appearances of, - 581
  - symptoms of, - - - 580
- Inflammation of the uterus, - - 579
- Inflammatory puerperal fever, treatment of, - - - 583
- Inner bark of cotton-root, 308, 456, 570
- Innominatum, - - - - 13
- Insanity after delivery, - - - 600
  - during pregnancy, - - - 153
- Interstitial pregnancy, - - - 134
- Intestinal irritation, - - - 606
  - diagnosis of, - - - - 606
  - prognosis of, - - - - 606
  - symptoms of, - - - - 606
  - treatment of, - - - - 607
- Introduction of catheter, 57, 124, 162, 251, 273, 305
- Inversion of the uterus, - - - 478
- Inversion of the uterus, diagnosis of, 480
  - galvanic heat in, - - - 484
  - prognosis of, - - - - 480
  - symptoms of, - - - - 478
  - treatment of, - - - - 480
- Irregular contractions, - - - 468
- Irritability, nervous, during pregnancy, 153
- Irritative fever from putrid absorption, - - - - 179, 475
- Ischia, planes of, - - - - 14
- Ischium, - - - - - - 14
- Itching of the genitals, - - 150, 154

- Jaundice, during pregnancy, - 159
  - of infants, - - - - 622

- Kiesteine, - - - - - 103
- Knee presentation, - - - 287, 381
  - diagnosis of, - - - - 391
  - treatment of, - - - - 391

- Labia majora, - - - - - 54
  - œdema of, - - - - - 334
- Labia minora, - - - - - 55
- Labia pudendi, - - - - - 54
- Labor, - - - - - 227
  - attentions required after, - 270
  - cause of, - - - - - 228
  - complicated, - - - - 425
  - condition of female in first stage of, 234
  - condition of female in second do., 237
  - condition of os uteri in first stage of, 235
  - condition of os uteri in second do., 237
  - condition of uterus in first stage of, 235
  - conduct of accoucheur in first stage of, - - - - 242
  - conduct of accoucheur in second stage of, - - - - 253
  - conduct of accoucheur in third stage of, - - - - 260
  - difficult, - - - - 303, 378
  - difficult, ergot in, - - 308, 325
  - difficult, in first stage, - - 303
  - difficult, in second stage, - 322
  - divisions of, - - - - 233
  - duration of, - - - - 227
  - duration of first stage of, - 237
  - duration of second stage of, - 239
  - first stage of, - - 234, 242
  - induction of premature, - - 560
  - lingering, (*see difficult Labor.*)
  - management of natural, - - 240

Labor, mechanism of, - - - 287
  methods of inducing premature, 565
  mode of examination in first stage of, - - - - 243
Labor pains, - - - - 227, 231
  false, - - - - - - 232
  true, - - - - - - 232
Labor, position for delivery in natural, 254
  premature, - - - 188, 560
  premature, induction of, - - 560
  premonitory signs of, - - 229
  preternatural, - - - 379
  protracted, (*see difficult Labor.*)
  rigors during, - - - 230
  rules to determine the character of, 248
  second stage of, - - 237, 253
  tedious, - - - - - 303
  third stage of, - - - 239, 260
  treatment of cramps during, - 254
  with pelvic deformity, treatment of, 345
  difficult, from mal-positions of the head, - - - - 362
  ergot in difficult, - - 308, 325
  ergot in natural, - - - 259
  treatment of difficult breech, - 390
  treatment of twin, - - - 418
  twin, - - - - - - 416
Laceration of perineum, - - 239
  of vagina, - - - - 488
Laxity of abdomen during pregnancy, 159
Left calcaneo-iliac position, - - 287
Left cephalo-iliac positions, - 258, 393
  diagnosis of, - - - - 393
Left lobulo-iliac positions, - - 376
  diagnosis of, - - 376
Left mento-iliac position, - 285, 369
  diagnosis of, - - - - 368
  mechanism of, - - - 369
Left-occipito-anterior position, 283, 289
  diagnosis of, - - - - 289
  forceps in, - - - - 536
  mechanism of, - - - 290
Left occipito-posterior position, 283, 296
  diagnosis of, - - - - 296
  mechanism of, - - - 297
Left sacro-cotyloid position, - 286, 383
  diagnosis of, - - - - 381
  mechanism of, - - - - 383
Lesser sacro-sciatic ligament, - 18
Lever, - - - - - - - 513
Ligament, great sacro-sciatic, - 18
  lesser sacro-sciatic, - - - 18
Ligament, obturator, - - - 18
Ligaments and articulations of pelvis, 16
Ligaments, broad, - - - - - 72
  of ovary, - - - - - - 74
  of uterus, - - - - - 72
  round, - - - - - - 72
  sacro-sciatic, - - - - - 17
Linea ilio pectinea, - - - 14
Lineæ albicantes, - - - - 271
Lingering labor, (*see difficult Labor.*)
Lip of os uteri, retention of anterior, 320
Liquor amnii, - - - - - 190
  excess of, - - - - - 307
Lobulo-pubal positions, - - - 375
Local signs of pregnancy, - - 98
Lochia, - - - - - - - 239
  deficient, - - - - - - 276
  excessive, - - - - - 275
Locked head, - - - - - - 357
Longings during pregnancy, - - 141

Making the bed, - - - - - 249
Malacosteon, - - - - - - 30
Male and female pelves, - - - 26
Malformation of the pelvis, - 28, 348
  indications of, - - - 39
Malpositions of the head, - - 362
Mammary abscess, - - - - 608
Management of breech presentation, 386
  difficult breech labors, - - 390
  ear presentations, - - - 375
  face presentation, - - - 372
  feet presentation, - - 386, 392
  knee presentation, - - 391
  labor with pelvic deformity, 345, 362
  mento-iliac positions, - - 372
  monstrosities, - - - - 424
  natural labor, - - - 240
  shoulder presentations, - - 395
  twin labors, - - - - - 418
Mania during pregnancy, - - 153
  puerperal, - - - - - 600
Mastodynia, - - - - - - 152
Measurement of the pelvis, - - 40
Meatus urinarius, - - - - 57
Mechanism of labor - - - - 287
  left mento-iliac position, - - 369
  left occipito-anterior position, 290
  left occipito-posterior position, 297
  left sacro-cotyloid position, - 383
  occipito-pubal position, - - 296
  occipito-sacral position, - - 301

Mechanism of right mento-iliac position, 372
  right occipito-anterior position, 295
  right occipito-posterior position, 301
  right sacro-cotyloid position, 385
  sacro-pubic position, 386
  sacro-sacral position, 386
Meconium, purging the, 268
Meigs' embryotomy forceps, 556
Membrana caduca, 184
  decidua, 184
Membrane, caducous, 184
  deciduous, 184
  germinal, 77, 187
  vitelline, 76
Membranes, premature rupture of, 321
  rigidity of, 320
  rupture of, 236, 321
  toughness of, 320
Menstruation, 88
  suppressed, a sign of pregnancy, 98
Methods of inducing premature labor, 565
Metritis, 579
  post-mortem appearances of, 580
  symptoms of, 579
Miliary fever, 614
  symptoms of, 614
  treatment of, 615
Milk fever, 277
Milk-leg, 590
Milk-scab, 632
Milk, secretion of in pregnancy, 101
Miscarriage, 167
Mixed pregnancy, 96, 127
Mobility of the pelvic articulations, 19
Mode of applying the forceps, 531
Mode of examination in first stage of labor, 243
Mode of performing craniotomy, 553
Moles, 129
  fleshy, 129, 174
Mollities ossium, 30
Mons veneris, 53
Monsters, 128, 423
Monstrosities, management of, 424
Morbid adhesion of placenta, 472
  treatment of, 473
Morph, 99
Mother's marks, 625
Muco-serolent discharge, 230
Mucous discharges from vagina, 160
Multiple pregnancy, 96, 127
Muscular pains during pregnancy, 153
Nævus materni, 625
Nasal catarrh, 634
Natural labor, position for delivery, 254
Nausea during pregnancy, 137
Navel, excoriation of, 625
  hemorrhage from, 625
Navel-string, 199
Nervous irritability during pregnancy, 153
Nervous shock, 270
Nine-day fits, 631
Nipple, excoriated, 277
  sore, 277
  ulcerated, 277
  sore, treatment of, 277
Nursing sore mouth, 615
Nymphæ, 55

Obliquely distorted pelvis, 35, 344
Obliquity of os uteri, 319
  of uterus, 319
Obstetrical instruments, 507–560
Obstetrical operations, 507–571
Obturator foramen, 15
  ligament, 18
Occipital positions, 283, 289
Occipito-pubal position, 283, 296
  diagnosis of, 296
  mechanism of, 296
Occipito-sacral position, 283, 301
  diagnosis of, 301
  mechanism of, 301
Odontalgia during pregnancy, 149
Œdema during pregnancy, 155
Œdema of labia majora, 334
Omphalo-mesenteric vessels, 192
Operation, Cesarean, 556
Operation of craniotomy, 553
Operative midwifery, 507–571
Ophthalmia of infants, 622
Organs of generation, 53
Orifice of the urethra, 57
Os coccyx, 13
Os illium, 13
Os ischium, 14
Os pubis, 15
Os uteri, 65
  agglutination of, 336
  cancer of, 336
  descent of, 320
  dilated by dry cupping, 328
  dilatation of, 231, 235, 248, 253, 315, 328

Os uteri, imperforate, 336
  retention of anterior lip, 320
  rigidity of, in first stage of labor, 311
  rigidity of, in second do., 328
Ossa innominata, 13
Osteo-sarcoma of pelvis, 338
Ovaries, 74
Ovarian pregnancy, 133
Ovarian tumor, 340
Ovular theory, 87
Ovule, or human egg, 76
Ovum, development of, 183
  dropsy of, 166

Pain in the right side during pregnancy, 158
Pain, muscular, during pregnancy, 153
Painless uterine contractions, 230
Pains, after, 272
  false, 232
  irregular, 306
  of labor, 232
  preparatory, 234
  treatment of false, 232
Palpation, abdominal, 107
Palpitation of the heart, 151
Parietal pregnancy, 134
Parturition, 227
Pathology of puerperal convulsions, 499
Pelvic articulations, mobility of, 19
Pelvic cavity, diameters of, 25
  planes of, 25
  tumors in, 337
Pelvic deformities, difficult labor from, 343
  management of labor with, 345–362
Pelvic presentations, 286, 379
  diagnosis of, 381
  management of, 386
  mechanism of, 383
Pelvic symphyses, 16
Pelvimeter, Baudelocque's, 41
  Coutoully's, 42
Pelvimetry, 40
Pelvis, 10
  abnormally large, 31, 344
  articulations of, 16
  axis of, 25
  brim of, 14, 22
  cavity of, 10, 24
  deformities of, 28, 343
  diameters of, 25
  dwarfish, 32, 344
Pelvis, indications of malformation of, 39
  obliquely distorted, 35, 344
  osteo-sarcoma of, 338
  straits of, 21
  unequally contracted, 32, 344
Pendulous belly, 265
Perforator, 552
Perineum, 59
  dilatation of, 288
  rigidity of, 60, 316, 328
  support to the, 59, 256
Period for applying forceps, 528
  for turning, 510
Phlebitis, crural, 590
  uterine, 580
Phlegmasia dolens, 590
  causes of, 591
  diagnosis of, 595
  post-mortem appearances of, 595
  prognosis of, 595
  symptoms of, 593
  treatment of, 595
Phlegmonous tumors, 342
Piles during pregnancy, 156
Placenta, 196
  adherent, 465, 472
  delivery of, 239, 263
  detachment of, 451, 466, 471
  expulsion of, 239, 263
  hemorrhage after delivery of, 452
  symptoms of hemorrhage after delivery of, 453
  treatment of hemorrhage after delivery of, 455
  morbid adhesion of, 472
Placenta prævia, 426
  diagnosis of, 428
  hemorrhage from, 426
  treatment of, 431
  treatment by Prof. C. H. Cleaveland, 439
  putrescence of, 179, 475
  retained, 464–473
  retained, treatment of, 465–470
  retention of, 464–473
  retention of from irregular contraction, 468
  retention of from morbid adhesion, 472
  retention of from uterine inertia, 465
Placental forceps, Cleaveland's, 516
  presentation, 426
  sound, 108

Plane of the inferior strait, 24
  of the superior strait, 23
Planes of the ischia, 14
  of the pelvic cavity, 25
Plethora during pregnancy, 147
Plurality of children, 412
Podalic version, 509
Polypus, 339
Porrigo larvalis, 632
  treatment of, 633
Position, first left cephalo-iliac, 285, 393
  first right cephalo-iliac, 285, 393
  first vertex, 283, 289
  fifth vertex, 283, 300
  for delivery in natural labor, 254
  fourth vertex, 283, 296
  left calcaneo-iliac, 287
  left mento-iliac, 285, 369
  left mento-iliac, diagnosis of, 368
  left mento-iliac, mechanism, 369
  left occipito-anterior, 283, 289
  left occipito-anterior, diagnosis of, 289
  left occipito-anterior, mechanism of, 290
  left occipito-posterior, 283, 296
  left occipito-posterior, diagnosis of, 296
  left occipito-posterior, mechanism of, 297
  left sacro-cotyloid, 286, 383
  left sacro-cotyloid, diagnosis of, 381
  left sacro-cotyloid, mechanism of, 383
  occipito-pubal, 283, 296
  occipito-pubal, diagnosis of, 296
  occipito-pubal, mechanism of, 296
  occipito-sacral, 283, 301
  occipito-sacral, diagnosis of, 301
  occipito-sacral, mechanism of, 301
  of the fetus, 213
  right calcaneo-iliac, 287
  right mento-iliac, 285, 372
  right mento-iliac, diagnosis of, 368
  right mento-iliac, mechanism of, 372
  right occipito-anterior, 283, 294
  right occipito-anterior, diagnosis of, 294
  right occipito-anterior, mechanism of, 295
  right occipito-posterior, 283, 300
  right occipito-posterior, diagnosis of, 300
Position, right occipito-posterior, mechanism of, 301
  right sacro-cotyloid, 286, 385
  right sacro-cotyloid, diagnosis of, 381
  right sacro-cotyloid, mechanism of, 385
  sacro-pubic, 286, 386
  sacro-pubic, diagnosis of, 381
  sacro-pubic, mechanism of, 386
  sacro-sacral, 287, 386
  sacro-sacral, diagnosis of, 381
  sacro-sacral, mechanism of, 386
  second left cephalo-iliac, 285, 393
  second right cephalo-iliac, 286, 393
  second vertex, 283, 294
  sixth vertex, 283, 301
  third vertex, 283, 296
Positions and presentations, 281
  left lobulo-iliac, 376–377
  left lobulo-iliac, diagnosis of, 376
  lobulo-pubal, 375
  lobulo-pubal, diagnosis of, 375
  mento-iliac, treatment of, 372
  of breech presentation, 286, 383
  of ear presentations, 375
  of face presentation, 285, 369
  of feet presentation, 287
  of shoulder presentations, 285, 393
  of vertex presentation, 283, 289
  right lobulo-iliac, 375
  right lobulo-iliac, diagnosis of, 375
Post-mortem appearances of inflammation of uterine appendages, 578
  appearances of inflammation of uterine veins, 581
  appearances of metritis, 580
  appearances of phlegmasia dolens, 595
  appearances of puerperal peritonitis, 577
Posterior commissure of the vulva, 56
Pregnancy, 92
  abdominal, 133
  affections of the bladder during, 150
  anorexia during, 141
  anteversio uteri during, 163
  areola in, 100
  audible signs of, 103
  calculus during, 166
  cardialgia during, 143
  cephalalgia during, 145
  changes in the uterus during, 110

Pregnancy, compound, 96, 127
  constipation during, 144
  convulsions during, 146
  cough during, 152
  cramp of stomach during, 144
  cramps during, 158
  despondency during, 153
  diarrhea during, 142
  difficult breathing during, 152
  diseases of, 135
  dimness of vision during, 151
  dropsy of ovum during, 166
  duration of, 93
  dyspnœa during, 152
  extra-uterine, 96, 130
  fainting during, 151
  falling of womb during, 160
  false, 96, 129
  fetal movements during, 102, 165
  gastrodynia during, 144
  general signs of, 98
  headache during, 145
  heartburn during, 143
  hematemesis during, 160
  hemoptysis during, 160
  hemorrhoids during, 156
  hernia during, 166
  hydrorrhea during, 164
  incontinence of urine during, 160
  insanity during, 153
  interstitial, 134
  jaundice during, 159
  laxity of abdomen during, 159
  local signs of, 98
  longings during, 141
  mania during, 153
  mastodynia during, 152
  mixed, 96, 127
  multiple, 96, 127
  muscular pain during, 153
  nausea during, 137
  nervous irritability during, 153
  odontalgia during, 149
  œdema during, 155
  ovarian, 133
  pain in right side during, 158
  palpitation during, 151
  parietal, 134
  piles during, 156
  plethora during, 147
  prolapsus ani during, 157
  prolapsus uteri during, 160
Pregnancy, prurigo during, 154
  pruritus of vulva during, 154
  ptyalism during, 140
  pustules of genitals during, 160
  rational signs of, 98
  retroversion of uterus during, 161
  rheumatism of the uterus during, 165
  rigidity of abdomen during, 159
  salivation during, 140
  secretion of milk during, 101
  sensible signs of, 100
  signs of, 96
  sound of fetal heart during, 108
  spasm of stomach during, 144
  spasm of ureters during, 150
  spasm of uterus during, 164
  sub-peritoneo-pelvic, 134
  suppressed menses during, 98
  sympathetic signs of, 100
  syncope during, 151
  synopsis of signs of, 124
  syphilis during, 166
  table of signs of, 124
  tangible signs of, 104
  toothache during, 149
  treatment of extra-uterine, 134
  tubal, 133
  tubo-abdominal, 134
  tubo-ovarian, 134
  tumors during, 166
  twin, 104, 128
  utero-tubal, 134
  utero-tubo-abdominal, 134
  vaginal discharges during, 160
  varicose veins during, 156
  ventral, 133
  vertigo during, 151
  vomiting during, 137
  with pelvic deformity, 560
Pregnant female, diseases of, 135
Premature labor, 188, 560
  modes of inducing, 565
Premature rupture of the membranes, 321
Premonitory signs of labor, 229
Preparatory pains, 234
Presentations and positions, 281
  compound, 377
  diagnosis of breech, 381
  diagnosis of ear, 375
  diagnosis of face, 368
  diagnosis of foot, 391
  diagnosis of knee, 391

Presentations, diagnosis of pelvic, - 381
    diagnosis of placental, - - 428
    diagnosis of shoulder, - - 393
    diagnosis of transverse, - - 411
    diagnosis of vertex, 246, 289–301
    management of breech, - - 386
    management of ear, - 375–377
    management of face, - - 372
    management of feet, - 386–392
    management of knee, - - 391
    management of placental, - 431
    management of shoulder, - 395
    management of transverse, - 412
    management of vertex, - - 246
    of an extremity with the head, 377
    of the breech, - - - 286, 379
    of the feet, - - - 287, 379
    of the knees, - - - 287, 379
    of the pelvic extremities, 286, 381
    of the shoulder, - - 285, 392
    of the side of the head, - - 374
    placental, - - - - 426
    positions of breech, - 286, 383
    positions of ear, - - - 375
    positions of face, - - - 285
    positions of shoulder, - 285, 393
    positions of vertex, - - 283
    transverse, - - - - 411
    turning in shoulder, - - 395
    vertex, - - - - 282, 287
Pressure on the aorta, - - - 457
Preternatural labor, - - - 379
Prevention of hemorrhage, - - 461
Prognosis of abortion, - - 172
    of intestinal irritation, - - 606
    of inverted uterus, - - 480
    of phlegmasia dolens, - - 595
    of puerperal convulsions, - 498
    of puerperal fever, - - - 582
    of puerperal mania, - - 603
    of ruptured uterus, - - 486
Prolapsus ani, during pregnancy, - 157
    of the cord, - - - - 412
    of the cord, diagnosis of, - - 413
    of the cord, treatment of, - 413
    uteri, during pregnancy, - 160
Promontory of the sacrum, - - 12
Protracted labor, (*see Difficult Labor.*)
Prurigo during pregnancy, - - 154
Pruritus of the vulva during pregnancy - - - - 154
Ptyalism during pregnancy, - - 140
Pubic arch, - - - - - 16
Pubic symphysis, - - - - 15, 16
Pubis, os, - - - - - 15
Puerperal convulsions, - - - 491
    causes of, - - - - 494
    diagnosis of, - - - 492–498
    pathology of, - - - - 499
    prognosis of - - - - 498
    symptoms of, - - - - 495
    treatment of, - - - - 499
Puerperal fever, - - - - 572
    causes of, - - - - 573
    prognosis of, - - - - 582
    treatment of, - - - - 582
Puerperal hemorrhage, - - 425–464
Puerperal mania, - - - - 600
    causes of, - - - - 600
    diagnosis of, - - - - 602
    prognosis of, - - - - 603
    symptoms of, - - - - 601
    treatment of, - - - - 603
Puerperal peritonitis, - - - 575
    diagnosis of, - - - - 577
    post-mortem appearances of, - 577
    symptoms of, - - - 575
Puerperal phrenitis, - - - 600
Pulse, vaginal, - - - - 124
Pulsation of the fetal heart, - - 104
Purging the meconium, - - - 268
Pustules of genital organs, during pregnancy, - - - 160
Putrefactive absorption, - 179, 475
Putrescence of placenta, - - 179, 475
Putting to bed, - - - - 266

Quickening, - - - - - 102

Rational signs of pregnancy, - - 98
Reaction of hemorrhage, - - 462
Red gum, - - - - - 622
Relaxation of the symphyses, - 19
Respiration, fetal, - - - - 215
Restitution of the head, - - 257, 293
Retention of the anterior lip of os uteri, - - - - - 320
Retention of the placenta, - - 464
    from irregular contractions, - 468
    from morbid adhesion, - - 472
    from uterine inertia, - - 465
    treatment of - - - 465, 470
    with hemorrhage, - - - 450
Retention of urine, - - 150, 273, 305
    of urine in infants, - - - 279

Retroversion of the uterus, - - 161
Rheumatism of the uterus, - 165, 309
Rickets, - - - - - - 28
  treatment of, - - - - - 29
Right calcaneo-iliac position, - - 287
  cephalo-iliac positions, - 285, 393
  diagnosis of, - - - - - 393
Right lobulo-iliac positions, - 375, 376
  diagnosis of, - - - 375, 376
Right mento-iliac position, - 285, 372
  diagnosis of, - - - - - 372
  mechanism of, - - - - - 372
Right occipito-anterior position, 283, 294
  diagnosis of, - - - - - 294
  mechanism of, - - - - - 295
Right occipito-posterior position, 283, 300
  diagnosis of, - - - - - 300
  mechanism of, - - - - - 301
Right sacro-cotyloid position, - 286, 385
  diagnosis of - - - - - 381
  mechanism of, - - - - - 385
Rigid abdomen during pregnancy, - 159
Rigidity of the membranes, - - 320
  of the os uteri, - - 311, 328
  of the perineum, - 60, 316, 328
  of the soft parts, - - 60, 316, 328
  of the vagina, - - - 316, 328
Rigors during labor, - - - 230
Rotation of the head, - - 52, 291
Round ligaments, - - - - 72
Rules for applying the forceps, - 531
Rules for determining the character
  of labor, - - - - - 248
Rupture of the bladder, - - - 488
  of the cord, - - - - - 474
  of the membranes, - - 236, 321
  of the membranes, premature, 321
  of the uterus, - - - - - 485
  of the uterus, diagnosis of, - 486
  of the uterus, prognosis of, - 486
  of the uterus, symptoms of, - 486
  of the uterus, treatment of, - 487
  of the vagina, - . - - 488

Sacro coccygeal symphysis, - - 18
  iliac symphyses, - - - 17
  pubic position, - - 286, 386
  pubic position, diagnosis of - 381
  pubic position, mechanism of, - 386
  sacral position, - - 287, 386
  sacral position, diagnosis of, 381
  sacral position, mechanism of, 386
Sacro sciatic ligaments, - - - - 17
Sacrum, - - - - - - - 10
  hollow of, - - - - - - 10
Sacrum, promontory of, - - - 12
Salivation during pregnancy, - - 140
Scirrhous tumors, - - - - - 342
Second position of vertex, - 283, 294
Second stage of labor, - - 237, 253
  condition of female in, - - 237
  condition of os uteri in, - - 237
  conduct of accoucheur in, - 253
  difficult, - - - - - - 322
  duration of, - - - - - 239
  inefficient contractions in, - 323
  management of, - - - 253
  rigidity in, - - - - - 328
Secretion of milk during pregnancy, 101
Section, Cesarean, - - 556
Sensible signs of pregnancy, - - 100
Separation of the symphyses, - - 19
  treatment of, - - - 20
Shock to the nervous system, - - 270
Shortness of the cord, - - - 329
Shoulder presentations, - - 285, 392
  cephalic version in, - - - 405
  diagnosis of, - - - - - 393
  management of, - - - 395
  positions of, - - - 285, 393
  turning in, - - - - - 395
Show, - - - - - - - 230
Signs of labor, premonitory, - - 229
Signs of pregnancy, - - - 96
  audible, - - - - - - 103
  general, - - - - - - 98
  local, - - - - - - 98
  rational, - - - - - - 98
  sensible, - - - - - - 100
  sympathetic, - - - - - 100
  synopsis of, - - - - - 124
  table of, - - - - - 124
  tangible, - - - - - - 104
Sinking of the uterus, - - - 229
Sixth position of vertex, - - 283, 301
Snuffles, - - - - - - - 634
Soft parts, rigidity of, - 60, 316, 328
Sore-mouth of nursing women, - 615
Sore nipples, - - - - - - 277
Sound of fetal heart, - - - 104
Sound placental, - - - - 103
Spasm of stomach, during pregnancy, 144
  of ureters, during pregnancy, - 150
  of uterus, during pregnancy, - 164

- Spine of the ischium, 15
- Spontaneous evolution, 402
- Spot, embryonic, 77, 188
  - germinal, 77
- Stages of labor, 233
- Still-born children, 261
- Strait, inferior, 23
  - axis of, 24
  - diameters of, 23
  - plane of, 24
- Strait, superior, 22
  - axis of, 23
  - diameters of, 24
  - plane of, 24
- Straits of the pelvis, 21
- Strophulus intertinctus, 622
- Sub-peritoneo-pelvic pregnancy, 134
- Subsidence of the abdomen, 229
  - of the uterus, 229
- Superfetation, 127, 225
- Superior strait, 22
  - axis of, 23
  - diameters of, 24
  - plane of, 24
- Support to the perineum, 59, 256
- Suppressed menses in pregnancy, 98
- Sutures and fontanelles, 47
- Swelled breasts of infants, 626
- Sympathetic signs of pregnancy, 100
- Symphyseotomy, 560
- Symphyses, pelvic, 16
- Symphyses sacro-coccygeal, 18
- Symphysis, sacro-iliac, 17
  - pubis, 15, 16
- Symptoms indicating interference, 259, 323
  - of abortion, 170
  - of aphthæ, 628
  - of cyanosis, 620
  - of ephemeral fever, 612
  - of exhaustion, 323, 447, 529
  - of hemorrhage after delivery, 453
  - of inflammation of the breasts, 609
  - of inflammation of the uterine absorbents, 581
  - of inflammation of uterine veins, 580
  - of intestinal irritation, 606
  - of inverted uterus, 478
  - of metritis, 579
  - of miliary fever, 614
  - of nursing sore-mouth, 616
  - of phlegmasia dolens, 593
  - of puerperal convulsions, 495
- Symptoms of puerperal mania, 601
  - of puerperal fever, 575, 578, 579, 580
  - of puerperal peritonitis, 575
  - of rupture of the uterus, 486
  - of uterine phlebitis, 580
- Syncope during labor, 489
  - during pregnancy, 151
  - from hemorrhage, 437, 459
- Synopsis of signs of pregnancy, 124
- Syphilis as a cause of abortion, 180
  - during pregnancy, 166
- Syphilitic vegetations, 342

- Table of signs of pregnancy, 124
- Tache embryonnaire, 188
- Tampon, 175, 177, 435
- Tangible signs of pregnancy, 104
- Tedious labor, (*see Difficult Labor.*)
- Theories of impregnation, 83
- Theory of epigenesis, 86
  - of evolution, 86
  - ovular, 87
- Third position of vertex, 283, 296
- Third stage of labor, 239, 260
  - conduct of accoucheur in, 260
- Thrombus, 489
  - treatment of, 490
- Thrush, 628
- Tongue-tied infants, 626
- Tooth-ache during pregnancy, 149
- Toughness of the membranes, 320
- Tractor, 513
- Transverse presentations, 411
- Treatment of abortion, 174
  - of accidental hemorrhage, 448
  - of after effects of hemorrhage, 460
  - of aphthæ, 629
  - of breech presentations, 386
  - of concealed hemorrhage, 448
  - of convulsions, 147
  - of coryza, 635
  - of cramps during labor, 254
  - of cyanosis, 621
  - of difficult breech labors, 390
  - of difficult labors, 303–318
  - of ear presentations, 375–377
  - of ephemeral fever, 613
  - of extra uterine pregnancy, 134
  - of face presentations, 372
  - of false pains, 232
  - of foot presentations, 386–392
  - of hemorrhage after delivery, 455

eatment of hemorrhage before term, 174, 431
  of hemorrhage from placenta prævia, 431
  of hemorrhage with retained placenta, 450
  inefficient action of uterus, 306, 323
  of inflammation of the breasts, 610
  of inflammatory puerperal fever, 583
  of intestinal irritation, 607
  of inverted uterus, 480
  of knee presentations, 391
  of labor with pelvic deformity, 345
  of mento-iliac positions, 372
  of miliary fever, 615
  of monstrosities, 424
  of natural labor, 240
  of nursing sore-mouth, 617
  of phlegmasia dolens, 595
  of placenta prævia, 431
  of placenta prævia, by Prof. C. H. Cleaveland, 439
  of porrigo larvalis, 633
  of prolapsed cord, 413
  of puerperal convulsions, 499
  of puerperal fever, 582
  of puerperal hemorrhage, 431, 439, 448, 450, 455
  of puerperal mania, 603
  of puerperal peritonitis, 582
  of reaction after hemorrhage, 462
  of relaxation of symphyses, 20
  of retained placenta, 450, 465
  of rheumatism of the uterus, 310
  of rickets, 29
  of rigidity of os uteri, 312, 328
  of rupture of the uterus, 487
  of separation of the symphyses, 20
  of shoulder presentations, 395
  of sore nipples, 277
  of thrombus, 490
  of transverse presentations, 412
  of trismus nascentum, 632
  of twin labors, 418
  of typhoid puerperal fever, 587
  of unavoidable hemorrhage, 431
remors during labor, 230
rismus nascentium, 631
  treatment of, 632
rue labor-pains 232
ubal pregnancy, 133
ubes, Fallopian, 73
Tubo-abdominal pregnancy, 134
Tubo-ovarian pregnancy, 134
Tumor, cauliflower, 342
  fibrous, 339
  fungous, 342
  ovarian, 340
  phlegmonous, 342
  scirrhous, 342
Tumors during pregnancy, 166
  in difficult labor, 337
  in pelvic cavity, 337
Turning, 508
  cases for, 509
  dangers of, 512
  in shoulder presentations, 395
  period for, 510
Twins, 127, 307
  diagnosis of, 128, 263, 417
  distension from, 307
Tympanites, acute, 606
Tympanitis of the fetus, 331

Ulcerated nipples, 277
Umbilical cord, 199, 267
  cutting the, 260
  prolapsus of, 412
  shortness of, 329
  treatment of prolapsed cord, 413
Umbilical hernia, 624
  vesicle, 191
Unavoidable hemorrhage, 426
  treatment of, 431
Unequally contracted pelvis, 32, 344
Unruptured hymen, 334
Urachus, 193
Ureters, spasm of during pregnancy, 150
Urethra, orifice of the 57
Urine, attention to, 242, 249, 251, 273, 305, 532
  incontinence of, 160
  retention of in infants, 279
Use of ergot, cautions respecting, 326
Use of the forceps, 525
Uterine absorbents, inflammation of, 581
Uterine appendages, inflammation of, 578
Uterine contractions, 227, 271
  by dry cupping, 328
  painless, 230
Uterine hemorrhage, 425–464
  treatment of, 431, 439, 448, 450, 455
Uterine inertia with hemorrhage, 452
  with retained placenta, 450, 465

Uterine phlebitis, - - - - 580
  diagnosis of, - - - - 581
  post-mortem appearances of, - 581
  symptoms of, - - - - 580
  treatment of, - - - - 582
Uterine prolapsus, during pregnancy, 160
Uterine veins, inflammation of, - 580
Utero-tubal pregnancy, - - - 134
Utero-tubo-abdominal pregnancy, - 134
Uterus, - - - - - - - 63
  anteversion of during pregnancy, 163
  broad ligaments of, - - 72
  changes in during pregnancy, 110
  condition in first stage of labor, 235
  diagnosis of inverted, - - 480
  diagnosis of ruptured, - - 486
  galvanic heat in inverted, - 484
  hour glass contraction of, - 468
  inefficient action of, 306, 323, 465
  inflammation of, - - - 579
  inversion of, - - - - 478
  ligaments of, - - - - 72
  obliquity of, - - - - 319
  prognosis of inverted, - 480
  prognosis of ruptured, - - 486
  rheumatism of, - - 165, 309
  retroversion of during pregnancy, 161
  round ligaments of, - - - 72
  rupture of, - - - - 485
  sinking of, - - - - 229
  spasm of during pregnancy, - 164
  subsidence of, - - - - 229
  symptoms of inverted, - - 478
  symptoms of ruptured, - - 486
  treatment of inverted, - - 480
  treatment of ruptured, - - 487

Vagina, - - - - - - - 60
  cicatrix in, - - - - 335
  laceration of, - - - - 488
  rigidity of, - - - 316, 328
  rupture of, - - - - 488
Vaginal cystocele, - - - - 331
  examination in first stage of labor, - - - - - 242
  hernia, - - - - - 333
  mucous discharges, - - - 160
  pulse, - - - - - 124
Vaginal vesicocele, - - - - 331
Varicose veins during pregnancy, - 156
Vectis, - - - - - - 513
Vegetations, syphilitic, - - - 342
Ventral pregnancy, - - - 133
Vernix caseosa, - - 213, 225, 267
Version, - - - - - - - 508
  cephalic, - - - - 405, 508
  podalic, - - - - - 509
Vertex presentation, - - 282, 286
  diagnosis of, - - - 289–301
  forceps in, - - - - 536
  mechanism of, - - - 290–301
  positions of, - - 283, 289–301
Vertigo during pregnancy, - - 151
Vesicle, blastodermic, - - - 187
  germinal, - - - 77, 202
  umbilical, - - - - 191
  Graafian, - - - - 75
Vesicula umbilicalis, - - - 191
Vessels, omphalo-mesenteric, - - 192
Vestibulum, - - - - - 56
Violent fetal movements, - - 165
Vital changes in the uterine tissues during pregnancy, - - 116
Vitelline membrane, - - - 76
Vitellus, or yelk, - - - - 76
Vomiting during pregnancy, - - 137
Vomiting in labor, - - - - 234
Vulva, - - - - - - - 54
  anterior commissure of, - - 55
  posterior commissure of, - - 55
  pruritus of, - - - - 154

Washing the child, - - - - 267
Washington, Dr., on dry-cupping, - 328
Waters, bag of, - - - - 235
  bag of, to distinguish from fetal scalp, - - - - - 247
  false, - - - - - 164
Weed, - - - - - - - 612
Weight and dimensions of the fetus, 218
Woman in labor, - - - 234, 241
Womb, falling of, - - - 160, 281
Wright, Prof. M. B., on cephalic version, - - - - - 405

Yelk, or vitellus, - - - - 76

INDEX TO SIXTH PART.

Achillea millefolium, Page 636
Acid gallic, 637
Acid tannic, 637
Acidum gallicum, 637
Acidum tannicum, 637
Aconitum napellus, 637
Aletridin, 639
Aletris farinosa, 638
Aloe socotrina, 639
Aloes, 639
Althæa officinalis, 640
Alum root, 686
Amaranth, 641
Amaranthus hypochondriacus, 641
American hellebore, 718
Ammonia, chloro-hydrate of, 641
Ammonia, muriate of, 641
Ammoniæ hydrochloras, 641
Anthemis nobilis, 641
Antispasmodic tincture, 694
Apium petroselinum, 642
Apocynum cannabinum, 642
Argenti nitras, 643
Aristolochia serpentaria, 643
Arnica montana, 644
Asclepias tuberosa, 644
Asclepidin, 644
Assafœtida, 645
Atropa belladonna, 646

Balsam, parturient, 650
Balsam, styptic, 700
Baptisia tinctoria, 647
Baptisin, 647
Bath, spirit vapor, 714
Belladonna, 646
Beth root, 717
Bidens bipinnata, 647
Bitters, restorative wine, 663
Blackberry, 708
Black cohosh, 660
Bloodroot, 709
Blue flag, 691
Borate of soda, Page 714
Borax, 714
Brake, buckhorn, 700
Brake, rock, 706
Buckhorn brake, 700
Buckwheat, 703

Calcined deershorn, 664
Calx, 648
Camphor, 648
Camphora, 648
Canada fleabane, 667
Capsicum annuum, 649
Catnip, 699
Caulophyllin, 652
Caulophyllum thalictroides, 650
Caustic, lunar, 643
Caustic of Filhos, 648
Caustic, Vienna, 648
Cayenne pepper, 649
Ceanothus Americanus, 653
Cedar, red, 692
Cephaëlis ipecacuanha, 653
Chamomile, 641
Chloroform, 654
Chloroformum, 654
Chloro-hydrate of ammonia, 641
Cimicifuga racemosa, 660
Cimicifugin, 661
Cinnamomum Zeylanicum, 662
Cinnamon, 662
Cleavers, 669
Coffea Arabica, 663
Coffee, 663
Cohosh, black, 660
Cohosh, blue, 650
Compound powder of ipecacuanha and opium, 648
Compound syrup of partridgeberry, 698
Compound tincture of iodine, 690
Compound tincture of lobelia and capsicum, 694
Compound tincture of Virginia snakeroot, 643

Compound wine of comfrey, 663
Convallaria multiflora, 663
Cordial, mother's, 698
Cornu cervinæ calcinatum, 664
Cotton-plant, 684
Cramp-bark, 719
Cranberry, high, 719
Crawley, 706
Cypripedin, 665
Cypripedium pubescens, 664

Datura stramonium, 665
Deer's horn, calcined, 664
Dewberry, 708
Diaphoretic powder, 648
Dioscorea villosa, 666
Dioscorein, 666

Elixir proprietatis, 639
Erechthites hieracifolius, 667
Ergot, 711
Erigeron Canadense, 667

False unicorn root, 686
Female regulator, 712
Feverfew, 707
Fireweed, 667
Firing, 668
Five-finger, 706
Flag, blue, 691
Fleabane, Canada, 667

Galium aparine, 669
Gallic Acid, 637
Galvanism, 669
Gelseminum sempervirens, 682
Geraniin, 684
Geranium, 684
Geranium maculatum, 684
Gossypium herbaceum, 684

Hæmastasis, 685
Haircap moss, 705
Hedeoma pulegioides, 685
Hellebore, American, 718
Helonias, 686
Helonias Dioica, 686
Hemp, Indian, 642
Henbane, 688
Heuchera Americana, 686
Hibiscus, marsh, 640
Hibiscus palustris, 640
High cranberry, 719
Honey, 697
Hops, 687
Humulus lupulus, 687
Hyoscyamus niger, 688
Hypericum perforatum, 689

Indian hemp, 642
Indigo, wild, 647
Iodine, 689
Iodinium, 689
Ipecacuanha, 653
Iridin, 691
Iris versicolor, 691
Iron weed, 719

Jessamine, yellow, 682
Juniperus sabina, 691
Juniperus Virginiana, 692

Kalmia angustifolia, 692
Krameria triandria, 693

Ladies-slipper, yellow, 664
Laurel, sheep, 692
Leonurus cardiaca, 693
Leopard's-bane, 644
Life-root, 712
Ligustrum vulgare, 694
Lime, 648
Lobelia, 694
Lobelia inflata, 694
Lunar caustic, 643
Lupulin, 687

Macrotin, 661
Madder, 707
Mallow, marsh, 640
Mandrake, 702
Marsh hibiscus, 640
Marshmallow 640
Marsh rosemary, 716
Maruta cotula, 697
May weed, 697
Mel, 697
Mitchella repens, 698
Monkshood, 637
Morphia, solution of sulphate, 702
Mother's cordial, 698
Motherwort, 693
Muriate of ammonia, 641

Nepeta cataria, 699
Nitrate of silver, 643

Oil of turpentine, 699
Oleum terebinthinæ, 699
Opium, 701
Osmunda regalis, 700

Papaver somniferum, 701
Parsley, 642
Partridge-berry, 698
Parturient balsam, 650
Pennyroyal, 685
Pepper, cayenne, 649
Pepper, water, 704
Pleurisy-root, 644
Podophyllin, 702
Podophyllum peltatum, 702
Polygonum fagopyrum, 703
Polygonum punctatum, 704
Polytrichum juniperum, 705
Poppy, 701
Potentilla Canadensis, 706
Powder of ipecacuanha and opium, compound, 648
Privet, 694
Pteris atropurpurea, 706
Pterospora andromeda, 706
Pyrethrum parthenium, 707

Raspberry, red, 708
Red cedar, 692
Red raspberry, 708
Red-root, 653
Restorative wine bitters, 663
Rhatany, 693
Rock-brake, 706
Rosemary, marsh, 716
Rubia tinctorium, 707
Rubus strigosus, 708
Rubus trivialis, 708
Rubus villosus, 708
Rue, 708

St. Johns-wort, 689
Sal ammoniac, 641
Sanguinaria Canadensis, 709
Sanguinarin, 709
Sarracenia, 709
Sarracenia purpurea, 709
Savin, 691
Scullcap, 710
Scutellaria lateriflora, 710
Scutellarine, 710
Secale cornutum, 711
Senecio aureus, 712
Senecio gracilis, 712
Senecin, 713
Sheep-laurel, 692
Silver nitrate of, 643
Snakeroot, Virginia, 643
Soda, borate of, 714
Sodæ boras, 714
Solomon's seal, 663
Solution of sulphate of morphia, 702
Spanish needles, 647
Spirit of turpentine, 699
Spirit vapor-bath, 714
Statice Caroliniana, 716
Stramonium, 665
Styptic balsam, 700
Sudorific tincture, 643
Syrup of partridge-berry, compound, 698

Tanacetum vulgare, 716
Tannic acid, 637
Tansy, 716
Terebinthinæ oleum, 699
Tincture, antispasmodic, 694
Tincture of iodine, compound, 690
Tincture of lobelia and capsicum, compound, 694
Tincture of Virginia snakeroot, compound, 643
Trillium pendulum, 717
Turpentine, oil of, 699
Turpentine, spirit of, 699

Unicorn-root, 638
Unicorn-root, false, 686

Valerian, 717
Valeriana officinalis, 717
Vapor-bath, spirit, 714
Veratrum viride, 718
Vernonia fasciculata, 719
Viburnum opulus, 719
Vienna caustic, 648
Virginia snakeroot, 643

Water-pepper, 704
Wild indigo, 647
Wild yam, 666
Wine bitters, restorative, 663
Wine of comfrey, compound, 663

Yam, wild, 666
Yarrow, 636
Yellow jessamine, 682
Yellow ladies-slipper, 664

NEW BOOKS IN PRESS,

AND
PREPARING FOR PUBLICATION,
BY

MOORE, WILSTACH, KEYS & CO.

25 WEST FOURTH STREET, CINCINNATI.

I.

A Hiſtory of Medicine,

FROM ITS ORIGIN TO THE CLOSE OF THE EIGHTEENTH CENTURY.
BY DR. RENOUARD, OF PARIS.
Translated by DR. G. C. COMEGYS, Professor in Miami Medical College.
One volume, large 8vo., of about 750 pages.

II.

An Introduction to the Study of Æsthetics

BY PROF. J. C. MOFFAT,
Of the College of New Jersey, Princeton. Author of "Life of Chalmers," etc. 1 vol. 12mo.

III.

Alleghan: a Poem,

BY N. M. GORDON. 1 volume, 12mo.

IV

The Teachers' Miscellany.

A Selection of Articles from the Proceedings of the College of Professional Teachers.
By J. L. CAMPBELL & A. M. HADLEY, of Wabash College. 1 volume. 12mo.—450 pages.

V.

Materia Medica and Therapeutics.

Embracing most Medicinal Substances used by the Medical Profession, and particularly the indigenous Materia Medica of America. With the latest Physiological and Chemical Discoveries.
BY DRS. CLEAVELAND & HOYT.
1 volume, 8vo., with numerous illustrations.

VI.

Man-of-War Life:

A BOY'S EXPERIENCE IN THE UNITED STATES NAVY.
1 volume, 16mo., illustrated.

VII.

The Merchant Vessel:

A SAILOR BOY'S VOYAGES TO SEE THE WORLD.
1 volume, 16mo., illustrated. By the same Author.

VIII.

Whaling and Fiſhing.

1 volume, 16mo., illustrated. By the same Author.

IX.

Merry Old England and her Hiſtory.

BY MISS JULIA CORNER. 1 vol., 16mo.. Illustrated.

X.

The Russian Empire:

ITS RESOURCES, GOVERNMENT AND POLICY

BY A "LOOKER ON," FROM AMERICA.

XI.

Cyclopædia of Modern Travel.

BY BAYARD TAYLOR, ESQ.,

Author of "Views-a-Foot." "Lands of the Saracen," "Central Africa," etc., etc.

Illustrated with numerous Maps and Engravings. 1 volume, large octavo.

JUST READY.

American Eclectic Obſtetrics,

BY JOHN KING, M.D.

Author of the American Eclectic Dispensatory, and Professor of Obstetrics and the Diseases of Women and Children, in the Eclectic Medical Institute.

SEVENTY ILLUSTRATIONS. ONE VOL. 8vo.—750 PAGES. PRICE, $4.

LARGE orders are already in hand for this work. It is as handsome a medical volume as has ever been produced in this country.

Will be sent by mail, post-paid, for cash received.

Dr. King's Chart of Urinary Depoſits.

Table of Urinary Deposits, with their Microscopical and Chemical Tests for Clinical Examinations. By John King, M. D. Cincinnati. This is a very valuable chart, giving, at a glance, the essential facts in regard to the various forms of urinary deposits, their chemical constituents, and their remedies. There are thirteen well executed drawings and several tables. This chart can be framed and hung up in the physician's office, and thus easily referred to. We heartily commend it to the attention of our readers. NEW JERSEY MEDICAL REPORTER, MARCH, 1855

TABLE OF URINARY DEPOSITS, &c. This is a valuable aid to any one who makes examinations of urinary deposits, containing 13 figures of these deposits as they appear under the microscope.—NEW HAMPSHIRE JOURNAL OF MEDICINE, APRIL, 1855.

A very useful and valuable chart. We congratulate Dr. King on the manner in which he has condensed this difficult but important subject, so as to present a bird's eye and clear view of the matter, in the form of a chart.—PHILADELPHIA MEDICAL AND SURGICAL JOURNAL, MARCH, 1855.

Carefully arranged, and will prove useful as a reference to the practitioner to refresh his memory, and materially aid the student in getting a clear idea of the subject.—AMERICAN JOURNAL OF PHARMACY, PHIL'A, MARCH, 1855.

Will be sent by mail, (*post paid*) for FIFTY CENTS, or may be had through Booksellers.

JONES' & MORROW'S

American Eclectic Medical Practice.

COMPLETE IN TWO VOLUMES, OCTAVO, 1650 PAGES. PRICE, $7, SENT BY MAIL.

EXTRACTS FROM NOTICES.

In these days of common sense in medicine, all respectable Physicians are Eclectics.—BOSTON MEDICAL AND SURGICAL JOURNAL.

It bears upon every page the stamp of Dr. J's vigorous, independent and practical style of thought. Such a work has long been needed, and we rejoice to know that it has been produced—DR. BUCHANAN, IN ECLECTIC MEDICAL JOURNAL.

The rapidity with which this work is called for, affords gratifying evidence of its value. The greater portion of a large edition has already been sold, and the demand is constantly growing.

The views maintained by the authors are stated with clearness and precision; the style is flowing and lively, and the whole book is remarkably free from the verbiage which is such a general feature of medical treatises.—N. Y. TRIBUNE.

Publications of Moore, Wilstach, Keys & Co.

"LEARN THAT TRUTH IS IN ALL" is as omnipresent in human knowledge as the great God of Truth is in his creation. Thus would the student be trained to be a true Eclectic, and seek for the truth in every system and every theory. He would find it in Allopathic, Homœpathic or Hydropathic systems, in bio-chemical, dynamical or histological theories.—FORBES' BRITISH AND FOREIGN MEDICAL REVIEW.

THE AMERICAN
ECLECTIC DISPENSATORY,

BY JOHN KING, M.D.

PROFESSOR IN THE ECLECTIC MEDICAL INSTITUTE, CINCINNATI.

One Volume, large Octavo, 1396 pages. Third edition now in Press.

◆

THE great demand that has existed for this work, and for the American Eclectic Practice, since their publication, a few months since, is deemed sufficient evidence to prove that they meet a long felt want of the medical profession. Thousands of copies have been eagerly purchased by physicians residing in nearly, or quite every State in the Union, and the demand has not before been so large or steady as at present.

NOTICES OF THE WORK.

GOOD OLD SCHOOL AUTHORITY.—The "American Journal of Pharmacy" speaks of the work as follows: "We have taken some pains to give it a careful examination, although pressed for time. ° ° ° The numerous plants which are brought forward as Eclectic Remedies, embrace many of undoubted value. ° ° The work embodies a large number of facts of a therapeutical character, which deserve to be studied. Many of these are capable of being adopted by physicians, especially by country physicians who have the advantage of more easily getting the plants. ° ° ° The attention which is now being given by the Eclectics, in classifying and arranging facts and observations relative to American plants, will certainly be attended with excellent results.

"The galenical preparations, extracts, syrups, tinctures, etc., peculiar to this Dispensatory, are mostly well constructed preparations, containing the virtues of the ingredients used; and we have no doubt that many of them are valuable agents. An account of one of these we have copied.

"It would afford us much pleasure to extract a number of the articles from the ECLECTIC DISPENSATORY, that would give a much better idea of the peculiar views and opinions of this set of practitioners, but the length of this article admonishes us to stop; yet we cannot close without adjudging to DR. KING the merit of giving perspicuity and order to the vast mass of material collected under the name of Botanical Medicine, and for his determination to oppose the wholesale quackery of Eclectic Chemical Institutes. The Eclectics have opened a wide field for the rational therapeutist and the organic chemist; and we hope that physicians and apothecaries will not be repelled by false pride or an unjust feeling of contempt, from reaping the harvest which will acrue to observation and experiment."

We add another extract or two:

"This volume is one which, in our opinion, the whole medical profession should be proud of. The work, comprising a much larger amount of knowledge than any other relating to the indigenous Materia Medica, to results of American research in organic chemistry. etc., seems to be emphatically an American work, and as such, is better adapted to our condition, and more applicable to the real wants of the physicians of this country.

"No one can fail to see, from an examination of this volume, that the medical resources of this country are being fast developed and systematized. Beside the remedies usually treated of in like works, this book contains an accurate description of about ONE HUNDRED AND FIFTY which are NEW, and many of which science hereby has rescued from blundering empiricism."—ROOCHCHESTER DEMOCRAT.

"The examination we have been able to give it, has convinced us that a great deal of labor has been bestowed upon the production, and that it contains an account of a larger number of the medical plants indigenous to our country, than any other work with which we are acquainted."—MICHIGAN JOURNAL OF MEDICINE.

Lengthy reports, commendatory of the work have been made, and several Medical Colleges have adopted it as a text-book. The publishers are happy to say that they are constantly receiving orders from every portion of the country.

Price $6, and will be sent by mail, free of postage, FOR CASH REMITTED FREE OF EXPENSE.

MOORE, WILSTACH, KEYS & CO., Publishers,
25 WEST FOURTH STREET, CINCINNATI.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

LANE MEDICAL LIBRARY

To avoid fine, this book should be returned on or before the date last stamped below.

7815
X365 King, J.
K53 American eclectic
1855 obstetrics.

NAME	DATE DUE